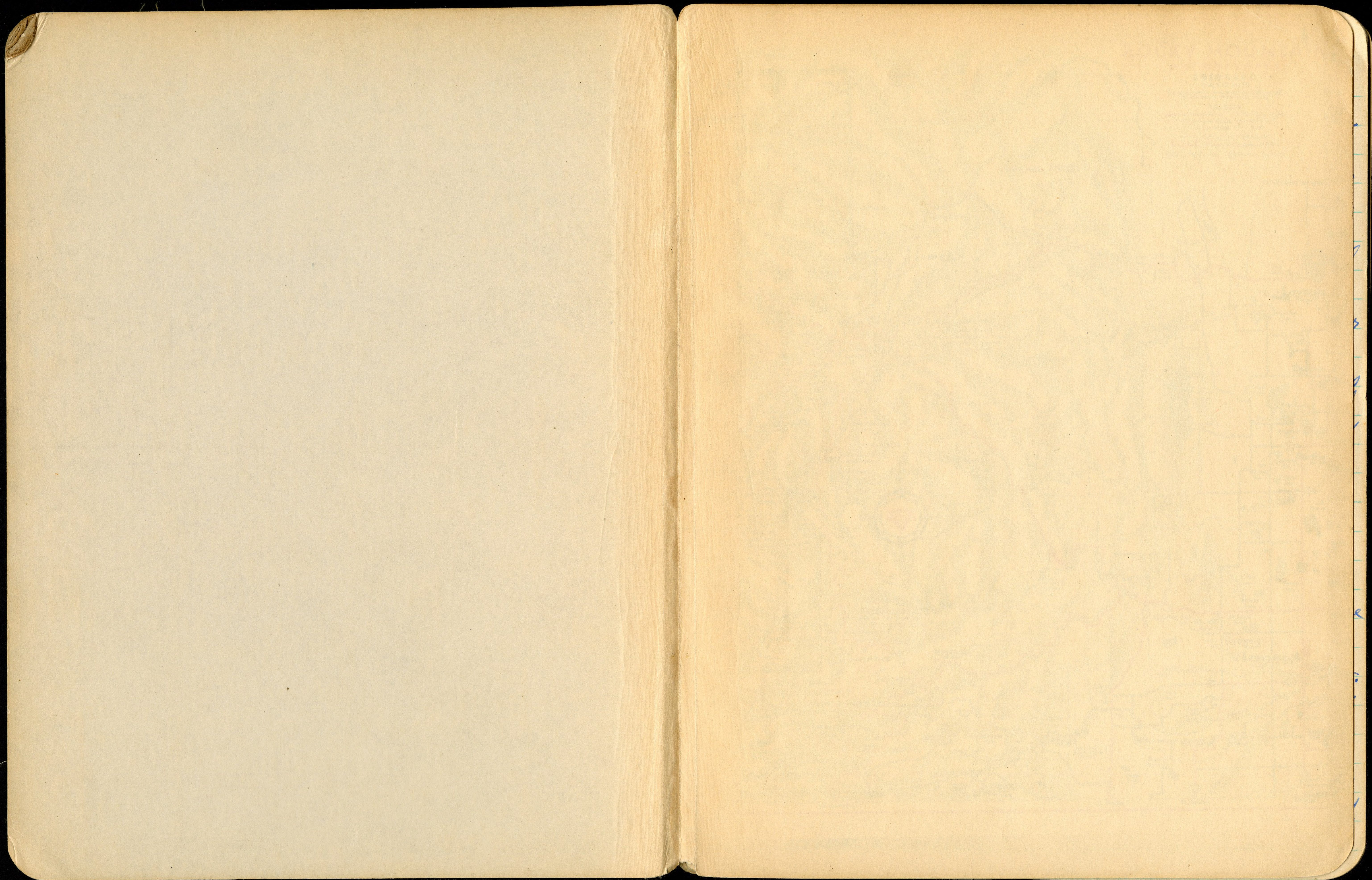
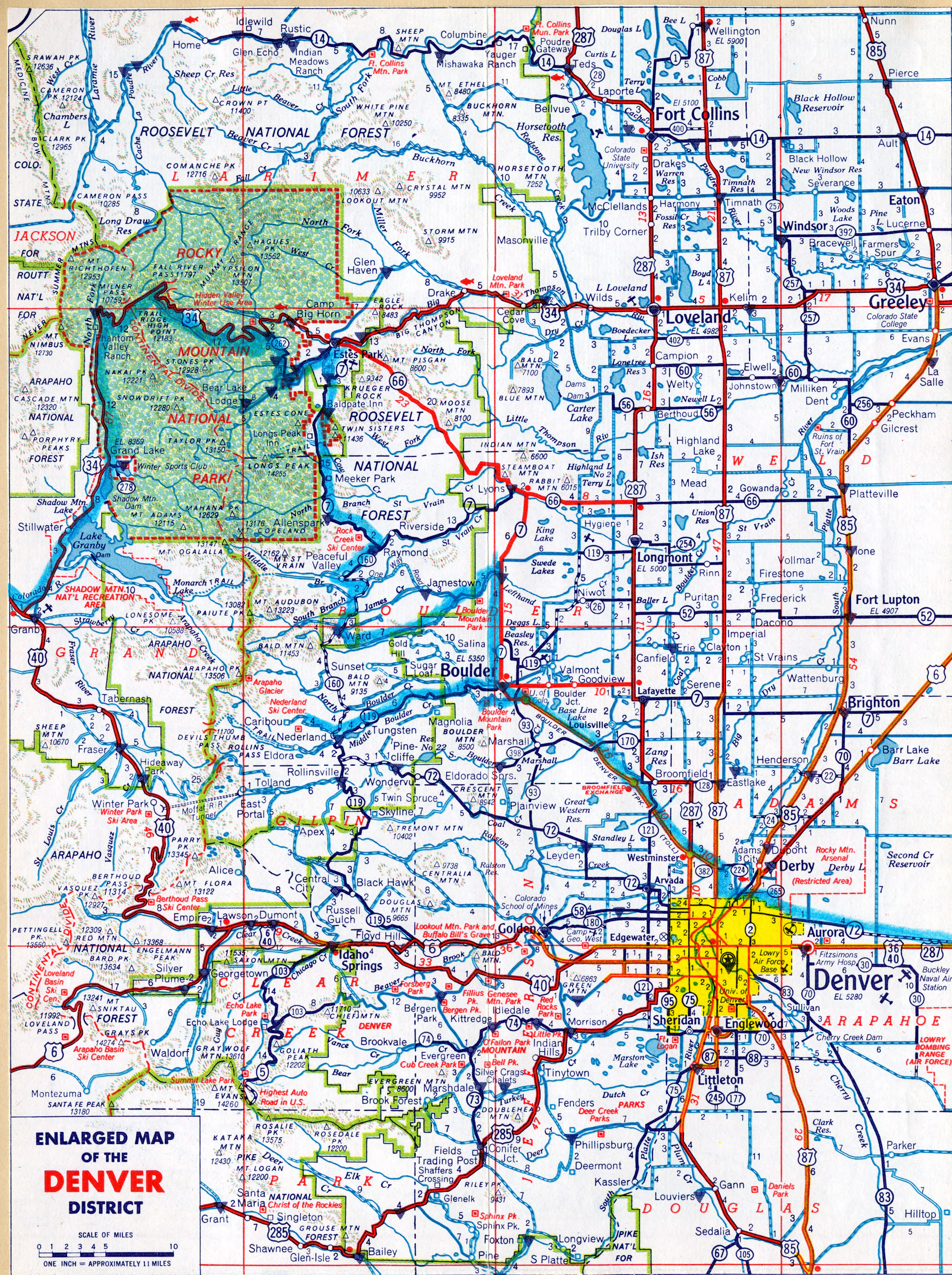


1960 Journal

1962

1964





1960
June 14. Left Carbondale with John Downey at 10:30 a.m.
Tues. in a university Ford 4-door (1960 model) for Utah,
Nevada, and Colorado.

Route was #13 to Pincheyville, #154 to Red Bud, #3 to
Jefferson Barracks Bridge, St. Louis Bypass to Bypass
U.S. 40, Bypass 71 north of Kansas City, #71 to St. Joseph,
U.S. 36 west to Marysville, Kansas. 530 miles

Arrived at 11 p.m. (CDT) and stopped at Thunderbird
Model (444) west of town. No collecting.

June 15 Marysville, Kans. to Boulder, Colo. miles. Route

Wed. U.S. 36 to Denver outskirts, #72 (bypass) to Denver-
Boulder Turnpike. Stopped at Tassle Model.

Station 1. On highway 36 near Stevens Center, Kans.
Running on pavement. 1 Carabid, large.

Station 2. 7 mi. east of Joes, Colo. on highway 36.
Many 7/8-inch Tenebrionids running on pavement
or sandy shoulder. 1 Mutillid. A variety of Hymen-
optera, flies, Mordellids, etc. on roadside plants.

Station 3. 5 mi. east of Byers, Colo. on highway 36.
Explanate *Eledus* with red stripe on each elytron
running on pavement (2). At least two species of
Meloidae on fl. black-eyed susans; also lacewing,
Chrysomelid, etc.

John visited Ronald Eff, amateur lepidopterist,
in evening, while I read proof of article for
SYSTEMATIC ZOOLOGY.

June 16. ^{Station 4.} Boulder & vicinity. Went out south of town to Chautauqua Mesa, where lupines were profuse. Learned to spot the eggs of "blues" on the undersides of leaves and on buds and spent the morning collecting them, to be mailed back to S.I.U. for rearing. Got 100+. Also found mature larvae, always on buds and associated with ants (two species). Collected several dozen adults, as well as miscellaneous bugs, bees, damselflies & beetles. After lunch (& purchase of hat, cap, sunburn lotion), drove up Flagstaff Mt. road about a mile, elev. about 7000 ft. above Boulder.

~~Station 5. (see above).~~ From Sta. 4. we mailed back 133 eggs. Majority were Plebejus icarioides. A few were Phaedon piasus. Both species were seen to oviposit on the same host plant, but piasus seems to select buds, whereas icarioides will lay on leaves, stems, and flowers. Other insects include 6 Raphidiidae, a large black sawfly and Cerambycid black with yellow transverse stripes. Will keep the mature larvae for parasite emergence. Kept the immatures with the associated ants. Host lupines were collected. ^{Lupinus}

Station 5. Flagstaff Mt. road about 1 mile above Chautauqua Mesa, 1000 ft. above Boulder. A few lupines. Found very little except a

~~green or blue Meloid.~~ few bees, bugs, beetles. No eggs or larvae

Then returned to Boulder and drove up the main canyon to the west - to Nederland. Then on up a road toward Caribou - a sky area. The car simply wouldn't pull the grade.

Station 6. Caribou, above Nederland, Boulder Co., 8800 feet, along an abandoned railroad embankment now used as a road. Lupines inconspicuous but abundant. 65 eggs found on buds. May have been 2 spp. of lupines (both collected). Many flowers of many sorts. Collected a few spiders (2 bright yellow), two bees under dung, several black spiders also under the dry cow dung, metallic Meloids.

Still at LaSalle Motel, Boulder.

June 17. North on rte. 7 to Left Hand Canyon, to visit one of Eff's lupine localities. Found it forked. Continued up main canyon west. 6500 ft. elev.

Station 7. 10 mi. W. of rte. 7 in Left Hand Canyon. A charming Sphingid on a glabrous lupine. 1 larva with ant and one or two eggs of a blue. Lupine sample collected. Several dozens adult blues, several large bumblebees. Also two more mature larvae with associated ants. Miscell. beetles & flies & wasps.

Speedometer 10,005

Lunch at Ward, Colo. Elevation 9254'. Altimeters both on the nose (set at Boulder). ^{Colo. rte. 160}

Station 8. 5 mi. north of Grand Lake. Speedometer 10,087.

Elevation 8750. 2 blues + small scarabaeid.

Station 9. On Highway 87, 1 mile w. on Gore Road. Dead beaver beside road, skull mashed. Took off left hind foot for stains. Elev. 7650.

From Estes Park followed Moraine Park road, crossed little moraine to w. end of Deer Mt., then took "new" Trail Ridge Road, which climbs to ^{12,143} ~~11,500~~ feet on the windwept ridge, then drops to Milner Pass at 10,759 feet as the road swings south to Grand Lake. Had a good view up our old valley north of the small moraine, but couldn't see any cabin. The view from Trail Ridge Road is grand.

Came out at Grand Lake on US 34, then west on US 40. Rabbit Ears Pass was closed for construction, so we took the Gore Pass Road to the south - rte. 87. It was dark all the way to Steamboat Springs, where we found a VFW convention and all rooms filled. So went on to Craig.

Speedometer - 10255.

June 18. Station 10. 4 mi. w. of Maybell ^{Colo.} on US 40. Elevation sat. 6250 ft. Speedometer 10290. Lupines of Great Basin variety. Saw no adults, one hatched egg on leaf. Collected lupine samples. Also the lupine from farther east, with mature larvae around base, with two species of ants in attendance. Large fly without mouthparts, *maic. Hymenops*. Two first instar larvae on "silver" lupine and several eggs ($\frac{1}{2}$ mile farther on). Lupine in plant press of two kinds: The one marked Host Lupine is the silver. The Non-host Lupine of plant press yielded the larvae at base. It has the prominent rib, the narrow folded leaves, and bright green color.

At Vernal stopped at Museum for directions into the Uintas. Also made reservation at a motel (Dinosaur) for tonight. Speedometer 10384.

Station 11. 20 mi. n. of Vernal, ^{Utah,} on rte 89. 8200 feet. Many isolated lupines. Found one empty egg, larval damage. Collected 50 or so adults of two or more species. Samples of lupines. 4-5 p.m.

Found a 10-point antler - old + broken. Also a Tucanid (*Platycerus*), a Carabid, a variety of wasps, a robber fly with captured moth, etc.

Blues included: *Phaedrotes piasus* (11), *Glaucopsyche lygdamus* (3), *Plebejus icarioides* (19♂, 6♀), *Lycaenopsis pseudargiolus* (1). Also *Coenonympha* (8), *Oeneis* (*laretic* - 1), *Papilio* (1).

Station 12. Vernal, Utah. At lights. 2 crickets and 1 Trichopteran.

Drove through part of the Uinta Basin, formed by the upended and truncated Mesozoic and Paleozoic beds separated by erosion from the mass of the Uinta Mountains. These beds are colorful, and continue into Dinosaur National Monument to the east. The Uintas visible from Vernal as north of it are rounded and tree-covered, with sharp box canyons and valleys. Farther back, they are more rugged and patched with snow. Highest peak is King's Peak, 13,498 ft., which is also the highest point in Utah.

June 19. Continued on US 40 about 20 mi. west of Duchesne, Utah. ^{Speedometer 10516.} Then, north on Rte. 208 10 mi., northwest on Rte. 35 along Duchesne River. This seems to be a continuation of Uinta Basin. For miles the telephone poles carried TV lead-in dual cable with connections to every house or ranch.

This road heads across the southwest corner of the Uintas.

Station 13. 14 mi. NW of Tabiona. 7320 ft. In Wolf Creek canyon. Papilio, Icaroides, Hymenoptera, Chafers in sweeping, Cicindela, large perfect Papilio abundant.

Station 14. Speedometer 10558. Same road.

Several hatched eggs, many male Icaroides and a few females. Pair of Asilids in copula. One pair of the blues in copula. Red & black Clerid. Elev. 7425 ft.

Continued on Rte. 35 to Kamas. Had a second lunch and doubled back on Rte. 150 into the Uintas. Mileage at Kamas was 10575. At 10,590 arrived at Soapstone Guard Station. 7800 feet.

Station 15. The "guard" didn't know of any Forest Service building we could use for an office. He is a temporary employee under the ranger.

We then continued over the pass to Mirror Lake, and on the way had a splendid view of the real Uintas, very rugged and grand.

The guard at Mirror Lake also knew of no lupine, so we went back over the pass.

My father did some geology in the Uintas in the first decade of the century, but I can't recall hearing any details about that trip.

June 20. Camped at 7500 ft. on Mirror Lake Road in Uinta
Mon. Mts., a few miles below Soapstone Guard Station.
The Wolf Creek Pass Road comes in at Soapstone but
was closed, so we came in through Kamas. At
Shingle Creek Forest Camp. Speedometer 10634.

Station 15. 3 mi. w. of Shingle Creek Camp. Open sage-
brush hillside and creek bottom. Many cicadas,
misc. bees, beetles (esp. Clerids), several Hesperids, etc.
Raphidoid apparently on sage, robber fly. 2 Aegeriids.
At entrance to Yellow Pine - Castle Lake Trail.

Station 16. 2 mi. above Hailstone, Utah.

1 Clerid. Photo of private fish hatchery.

Station 17. 5 mi. ^{at H.S. 10} n. in East Canyon. 6025 feet.

Speedometer 10676. General collecting. Many

✓ Cicadas, flies, 25 eggs + 1 ♂ icarioides, Hymenops,
grasshoppers.

Station 18. "Parley's Last Chance" station, 1 mi. s. of
Tamb Canyon on ~~the~~ US 70. Elev. 5850 ft. Lupine in

✓ bloom, eggs on leaves + buds, 2 ♀ + 1 ♂ icarioides flying.
1 Crambycid, small beetles, 1 Colias, a bumblebee, etc.

June 21. Went up to Biology Department at the University.

Tues. Had a nice visit with Angus Woodbury, who
showed us a new proposal to protect the
Rainbow Bridge from Colorado River develop-
ment plans. Beautiful aerial photographs
of the canyon regions involved.

Had lunch with Don M Rees and A R Gaufin,
at the Union Cafeteria. Then found Steven
Janson, who has been marking blues in
advance. ~~the~~

Drove up Big Cottonwood Canyon, where
Steve demonstrated his marking method,
using red India ink. The specimen marked
flew normally, but never very far. She seemed
worn. After first flight of 4 feet, she rested
for 20 minutes, and then flew only when
directly disturbed, for only a few feet,
seeming to be impaired or upset. The
marked wing seemed to be damaged.

Station 19. Mouth of Big Cottonwood Canyon,
elev. 5100 ft. Count of lupine stalks/eggs was
17/51 (John) + 5/50 (Dick). 2 spp. of Bombyliids, 1 ♂
✓ Plebejus melissa (it was common on clover), 3 or 4
✓ Strymon melinus in excellent condition, 1 ant in
association with icarioides larva, 3 larvae in all.
Thistles in bloom: 1 larva ready to moult.

Station 20. Brighton, top of Big Cottonwood Canyon. About 8300 feet. 1 sawfly, ² Cicin-
 -Ida, Callophrys sp. (green hair-sheath), Phyciodes,
 3 or 4 small Asilids, Cicadas were singing but
 not collected.

Included in this was a side trip 2 miles up
 the Guardsman Pass Road, where the lupines were
 found, but very immature. No blues seen.

June 22. Took car for oiling, greasing, carburetor adjustment.
 Wed. Then drove up benches ~~back~~ of north of city.

Station 21. City Creek Canyon above Salt Lake City.
 Few lupines, only 3 hatched eggs. 6 icarioides,
Phylodes, melissa, Everes ^{cornutus} ~~amarula~~, Strymon
molinus, good general collecting. Acmaeodera,
Anthriscids, Cremastocheilus, Coccinellids, bee
 flies, many Hymenops, a Thysanuran, etc.
 All in about an hour.

Station 22. Emigration Canyon, above Salt Lake City.
 Elevation 5850. Many ~~flowers~~ lupine,
 1 ~~major~~ mature icarioides larva with ants, very large;
 took lupine count and samples, another larva with
 smaller ant, about 6 adults, 1 piacus, 1 melissa,
 a white skipper, large Sphinx larva on road evi-
 dently parasitized, many snake flies on lupine,
 large reddish Tudius also on lupine, 1 Cicada, mic.
Hymenops, Acmaeodera, 2 Clerids.

Station 23. Reservoir in upper part of East Canyon,
 on road from Emigration Canyon to Hennefer or
 Morgan. 2 flies.

John spent the evening with friends, so I
 took his mother to dinner at the Hot Shoppe and
 then mounted part of the day's catch.

June 23 Out at 9:15 after putting away some of last
 Thurs. night's catch. Headed for Mill Creek Canyon,
 between Parley's and Big Cottonwood.

Station 24. 10 mi. above mouth of Mill Creek
 Canyon, elev. 7550. 4 Glaucopsyche, 3 Everes (tailed),
 3 Asilids, 1 Syrphid, 1 sawfly, 2 Clerids. Glabrous
 crisp lupine collected. Two yellow & a red flower
 also collected. Egg count 0/33 stalks.

John described the varied relationships between
 the Tyrannidae and ants. Some are completely
 independent, some facultative myrmecophiles, and
 some obligate. Referred to Balduf's summary.
 John has been accumulating the data on this
 one family and may publish it.

Station 25. 1 mi. above entrance to Mill Creek
 Canyon. Elev. 5350. No lupine. Acmaeodera, a
 small hermesid, Plebejus acmon, Phidoxes luteoides,
Callipsyche fehrii (all 3 blues), large dragonfly, ano-
 ther sp. of snakefly, 1 Cicada.

Station 26. 1 mi. above Alta, Utah, on road to upper basin. No blues, took lupine sample. 2 Cicadella, robber flies, green chafers, bugs.

Station 27. Little Cottonwood Canyon. Speedometer 90%. Elev. 6660. Lupine in bloom, eggs on 2/50 stalks. No adults. (Light rain just passed. Nemognathine on thistle, Hymenops, clusters of Bembex, bumble bees, Acmaecodera, wasps, Malacoderm?

Station 28. Same as Sta. 19. Lupine very old, no blues, no eggs, no larva. On bench to east, south of Canyon entrance, saw one egg, took one larva.

June 24. Out to Stansbury Mts. south of Great Salt Lake. Fri. Searched for lupines near base of canyon; found none.

Station 29. South Willow Canyon, 9 mi. s.w. of Grandville, Tooele Co., Utah. Elev. 7300 ft.

Many moths flying, Cicadas high. ^{Many} Speyeria ^{conspicua} for Donald Eff. Philotes (2), Evers amymetula +, Tachinids, Tabanids, Bombyliids, Theresiids, Stenotomids, Muscids, Tipulids. Very large Bumblebees, ^(3 spp.) on thistle at lower elevations, 2 Meloids, 1 clerid also on thistle; Ephocoids, a bronze Buprestid, lacewings.

Station 30. North Willow Canyon, e. side Stansbury Mts., Elev. 6050 ft. Many Speyeria, Cedar-sage area, - Erigeron, Sago, thistle. Melissa, Mitoura siva. Aegerid.

Station 31. Pass between Grandville & St John. Elev. 5450 ft. Large field of thistles. Took a few Nemognathines, some Clerid or Malachids, many types of Hymenops, Cicadas,

Station 32. Johnson's Pass between ^{the} Stansbury and the Onagui Mts. Elev. 6237 ft. Speyeria, slender Asilids, in copula, Bombyliid, 1 colias alexandra, vial of ladybirds from thistle. ^{Dermatids from dead rabbit. also Hesperids.}

Station 33. Eureka, Utah. Cemetery west of town. One large Elaterid only.

June 25 Sat. The only place near Salt Lake City where we have found much was Parley's Canyon (Rte 40), where we collected the day we arrived, so we went back there for another try.

Station 34. Same as sta. 18. Parley's Canyon, elev. 5800 ft. Took a score or more of eggs, at least two score male icarioides and 8 or 10 females. Kept the latter alive to see if they wouldn't lay more eggs for us. ⁽²⁾ No larvae. John sifted several ant nests for pupae, but they weren't in evidence. Stalk count of icarioides, of 135 stalks 16 had eggs, additional stalks uncouned. All females except four died by 2 p.m. Sunday without laying eggs. One egg was laid by that time. These four put in sum.

June 26. Spent the morning mounting insects, cleaning
 Sun. bottles, and preparing for more travels. In the
 afternoon I called on Arthur & Crawford, his
 wife, and their granddaughter Mayorie. Stayed
 for supper and until 9:30 chatting with Arthur.
 He's always interesting, and we ranged from
 politics to philosophy to evolution and back
 to L.D.S. and Catholicism as authoritarian
 religions compared to Protestantism in general.
 Mrs. Crawford particularly emphasized their fond-
 ness for EB and their indebtedness to him for
 past help and friendliness. Home in time to
 write a letter to EB + SBB.

John to his aunts, Emily + Dean Henroid, and
 then took his grandmother, Ella Owens, and his
 mother to see a 95-year-old lady from Eureka.

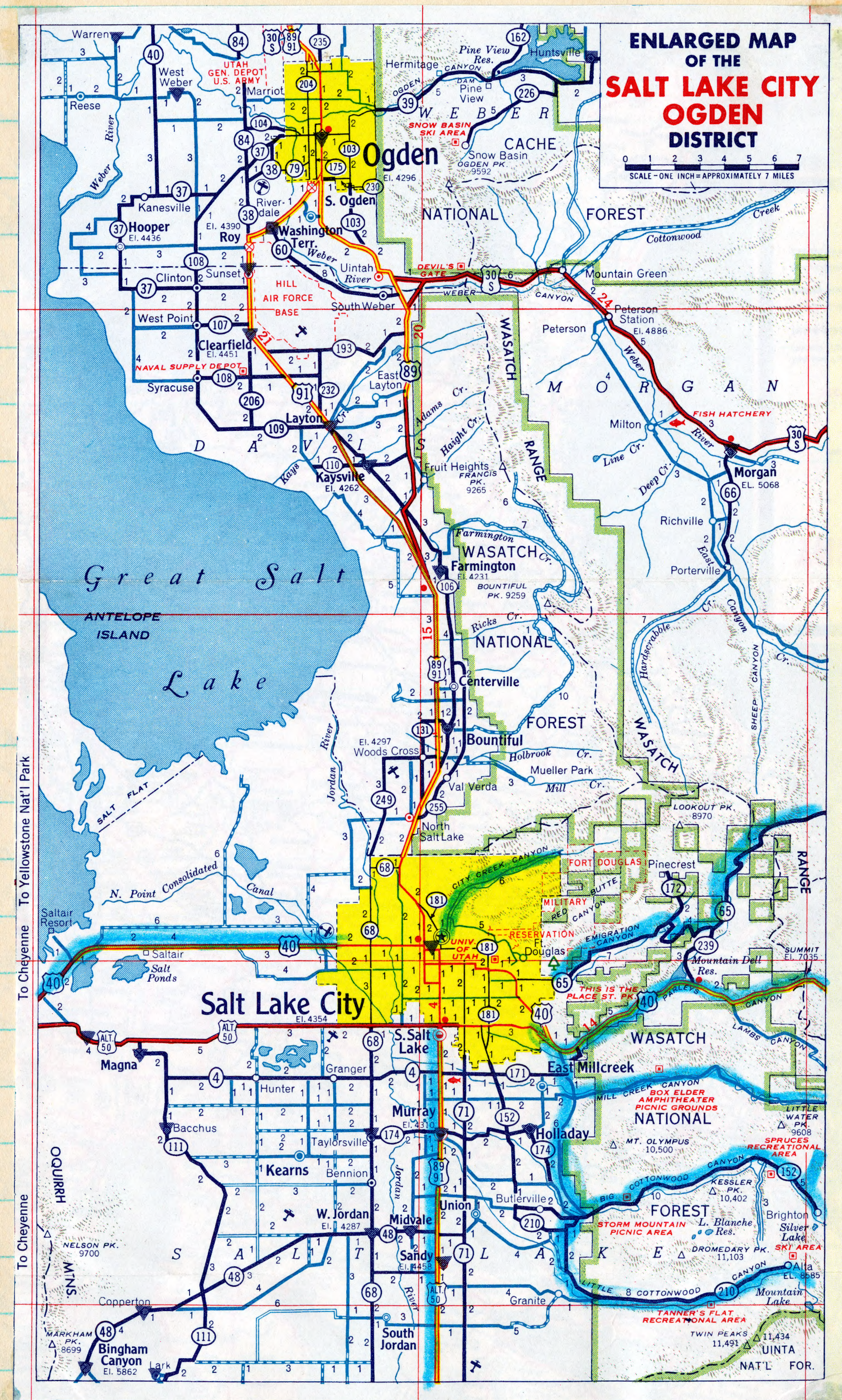
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US 40
 ←

Fast Friday from Johnson Pass we headed south-east to visit Eureka, where John was born. We turned up Church Street looking for the Downey's former home - birthplace - but the house was gone and not even foundations visible. We inquired directions from a young lady who turned out to be a former student of John's at Utah U, now married to a former friend of John, Frank McCabe, who works for Continental Mine Co. of Eureka. He had just been a bad auto accident. We then drove back west to the cemetery, where a Mr. Webb told us much about the arrangements.

John's grandfather's grave is there - in "Catholic Row" - but we couldn't find it. (Later told that it is unmarked. Found the Owens' (maternal grandmother) plot, where her son Frank is buried. Found plot of another John C. Downey - no relation. He was also an electrician at the mines, as was John's father, but the latter was also Chief of Police of Eureka. Mr. Webb recognized the right Downey as: "Oh, yeah. The Cop! The guy that got the Legion of Honor."

The Croix de Guerre with six palms awarded personally by Foch. Also the Medal Militaire. Also the Silver Star from Pershing. Recommended also for Congressional Medal of Honor, but it was never awarded.

He was an electrician stringing communication lines, but sometimes he had to carry messages as a runner. On three such trips he was gassed, and died of this in February 1933 in the Veterans Hospital in Tucson, Ariz. He was buried with full military honors in Salt Lake City, and the family rode with the casket from Tucson.

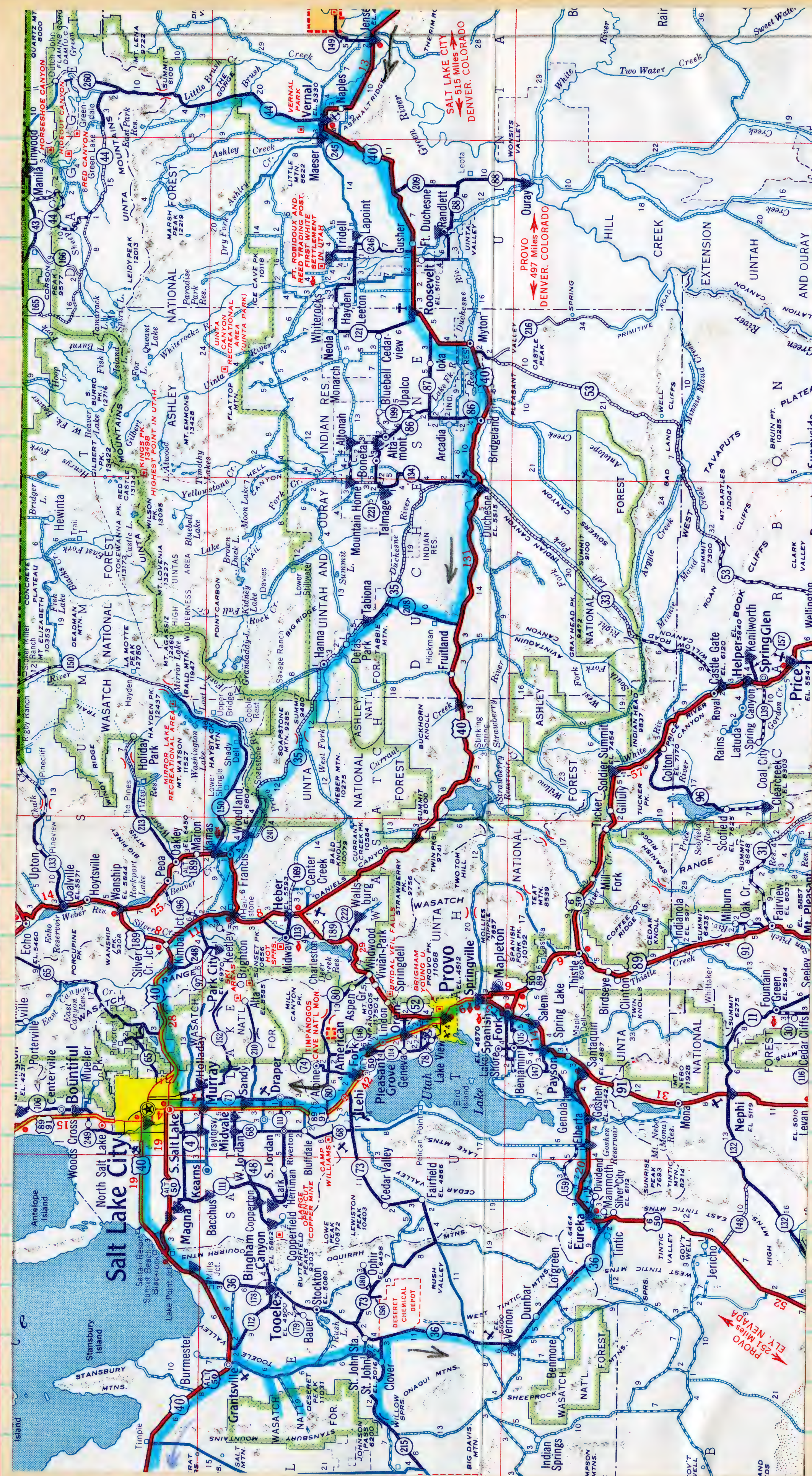
We continued northeast to Santaquin, east of the south end of Utah Lake, where we stopped for a few minutes to see June Downey Stewart, who is a cousin. She had seen the grave within 3 years.

Then on to Provo where we stopped again to see Jessie Downey (or) who is June's brother, another cousin, who was living in Tucson with the J C Downeys the year in the hospital.

John's mother is Cleone Owens Downey. Her mother is Ella Owens whom we visited several times. (We stayed with Cleone while in Salt Lake.) She is 82, very alert, hears well, sees better than she admits, plays bridge, lives alone, and has a remarkable memory even for recent things.

Cousin Charlotte Edlin (daughter of Emily & Dean) called one evening. Another daughter, Frances, lives in Boise, Idaho.

June 27. Up early to pack, do some errands, and leave for Mon. ~~to~~ Nevada. Went to University to borrow 6 Shmitt boxes, as I've filled the five we brought. Then met Steve Laurant. Waited an hour for the mailman, and in the meantime went down to Zion Bookstore. Couldnt find out anything about a rumoured history of the Tintic Mining area (Eureka), but saw some interesting things. A first edition of Spencer's Principles of Biology (\$17.50), a volume called "East of the Sun and West of the Moon" by Kermit Roosevelt, Patton's Evolution of the Vertebrates which I snatched up for \$5.00, an Italian dictionary, a Portuguese one, a Swedish one, all of which were new and \$4.00 each, and a new book on the mountains of Wyoming. Looked interesting but may be primarily concerned with recreation. John wanted a copy of Wallace's but resisted it. Also a book on cannibalism! This is a large bookstore with many interesting books, including copies of Haeckel, an old Swinerton paleontology, much western history, quite a few philosophical science books, and the many popular evolution books.



Followed US 40 to Wendover, then on to Peguop Summit 20 miles east of Wells. Found lupine scarce in same locality as previous years and took a few eggs. Then two miles west, below the summit, found a side road through a gate up a narrow winding valley to the southeast. Followed it a mile in the car and then another mile on foot. At the end of the two miles found lupine in abundance, with some eggs.

Station 35. Peguop Summit on US 40, 24 mi. west of Wells, Nevada. *Icaroides* eggs rare on lupine (same as collected 1959 and earlier).

Station 36. Small canyon southwest of Peguop Summit, same elevation. Eggs on lupine, bringing to 47 the total for "Pohay". An *Eleodes* and

Station 37. Wells, Nevada. At lights, a few dark *Melolontha* and a smaller *Melolonthine*.

Speedometer 11483

June 28 Decided to stay in Wells another night and work
Tues. in the Ruby Mts. So drove down the east side, after mailing the 46 eggs collected last night. They go by Air Mail, but from here that may take more than two days.

Station 38. 13 mi. n. of Ruby, Nev. Much lupine along road at elev. of 6000 ft. Eggs scarce, 1 ♀ + 1 ♂ *icarioides*, 1 *Melissa*, misc. flies + hymenoptera. Took sample of lupine. Three cast skins of larvae on lupine. More ~~hatched~~ eggs than unhatched. Quite a few Neuropteran eggs. Larger red and black ants on one lupine - antagonistic - but they were definitely sending red aphids.

Station 39. Along road just south of Ruby Valley, Nev. Many blues but few *icarioides*, eggs scarce, fine general collecting: 2 *Phipphorids*, red weevils, many Diptera + Hymenoptera. (See list on next page.)
also 2 Sapygidae.

Had lunch at the Park House, a hunting lodge and beer bar at Ruby Valley, which is nothing more than that. Had lunch with the family for \$1.25 each. OK except for lack of liquids. Continued south to Harrison Pass road over Rubies.

Station 40. Harrison Pass over Ruby Mts, Nev. at top, elev. 7247 ft. Red *Aphodius* and small black *Histerids* + a few *Staphylinids* under cow dung. At first found no larvae, then found a series of very rich clumps, probably yielding several hundred in two hours. (Actually 406.) Many were on very lowest leaves. A few other insects.

At sta. 39 the following *Tycaenidae*:

- L 15 *Plebejus melissa*
 6 *Phaedrotas pius*
 3 *Plebejus icarioides* (10♂, 2♀)
 4 *Lycaena helloides*
 3 *Strymon calanus*
 1 *Strymon titus*
 1 *Satyrrium fuliginosum*

The Ruby Mts. seem to be in three parts, with the northeasternmost part called East Humboldt Mts. The pass between these & center section is Secret Pass and between the two others Harrison Pass. I saw only faint indications of the fault scarp along the eastern face. Nowhere did we see any garnets, although the schist was present. The mountains are much more rugged than I remembered them, with water in abundance flowing out on both sides. There are said to be at least two "roads" up canyons on the east side.

The Harrison Pass road on the west side comes out south of Jiggs. The Kleckner ranch was not clearly evident, but one was labelled K. I saw no Post Office at Jiggs. The valley to the west is entirely different from that to the east. It's higher and much dissected, better watered.



Speedometer 11663

June 29
Wed. Got to bed late last night because we collected until seven and then had to return to Wells where we still had a motel room - nearly 100 miles. Then counted the 426 eggs and prepared for mailing. Mounted part of the many other insects.

Station 41. Canyon on n.w. side of Secret Pass. Elevation 6150.

Probably only 1 species of lupine, but it looks more lush on west facing slopes. Eggs on these; four lupines preserved, one on which eggs were found, others labelled "Host?" An east facing slope probably same lupine, but with more eggs - specimen marked "Host with eggs - east facing slope." 1 ♂ *icarioides*, few miscell. also below

We had circled west and south and east from Wells past Starr Valley into Secret Pass road, which is newly built and asphalted from the east side to the entrance to the down grade on the west side. Tush park area at top of the pass - el. 6457 ft - extending into several square miles. Much grazing. Several farms.

At Sta. 41 took altogether 30+ eggs, 4 ♂♂ + 6 ♀♀ + 15 adults, *Satyrium* common flying. Also *P. melissa*. 1 Cicada, Chrysids, 4 spp. of bee flies, Larid wasps.

Then out onto flats again and 16 miles south to Lemaille. Lunch in a tavern, plus a pony of Curacao and some beer, then to mouth of Lemaille Canyon.

Sta. 41-44

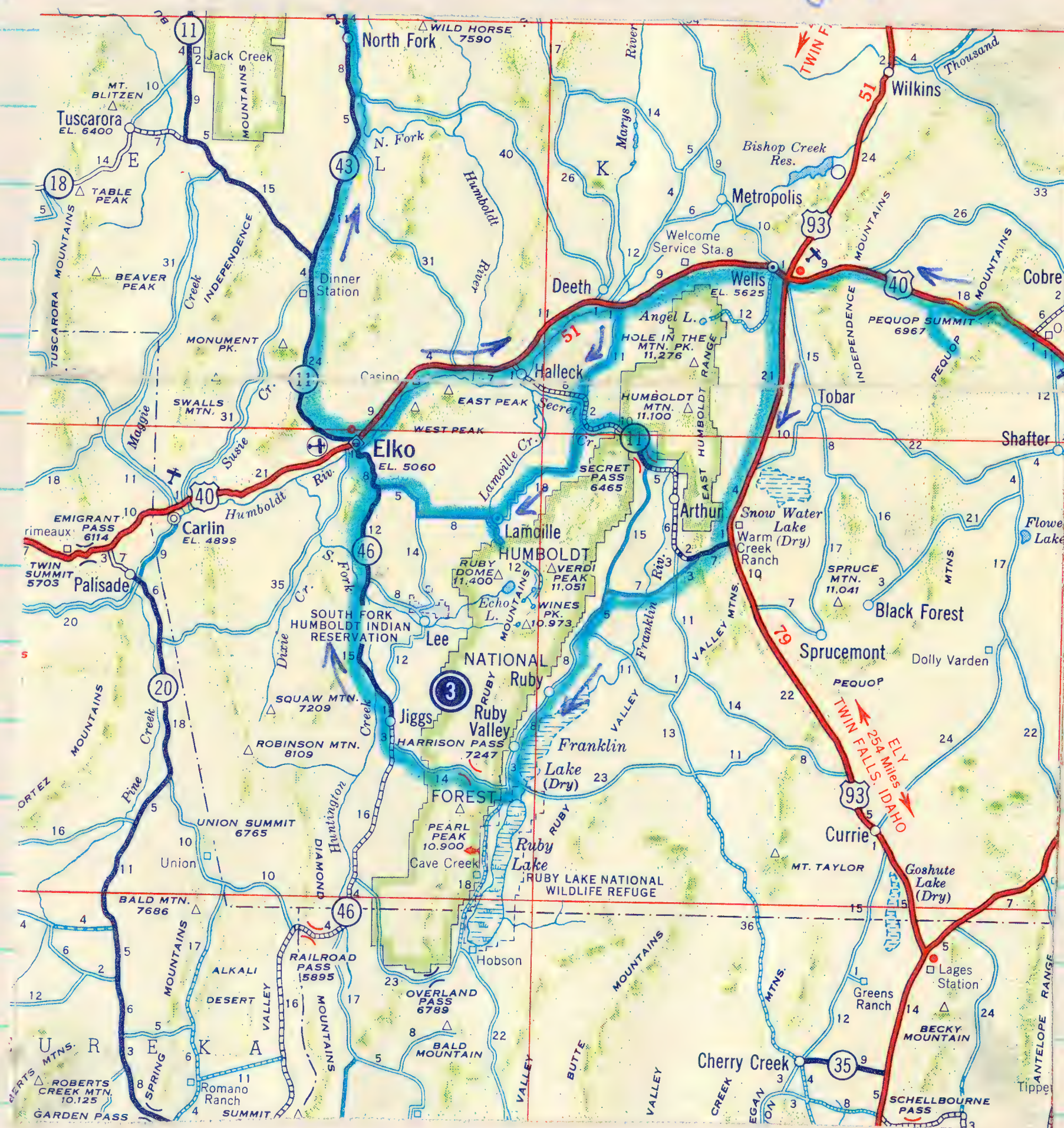
Station 42. Mouth of Lemaille Canyon, n.w. side of Ruby Mts, east of Elko, Nev. Elev. 6175 feet. Sample of a silvery lupine - apparently the host last year. No eggs but much moth (mail larvae) damage. Very dirty situation. 2 *icarioides* ♀, 1 Cicada, 1 Asilid, Vespids, green blister beetle, Mordellids, several "horns", a humble bee, a Chrysidid, 2 spp. *Nomadidae*.

Station 43. 5 mi. west of sta. 42 on sagebrush bench, Lemaille - Elko Road. *Melissa* on clover, sample of lupine, ~~see~~ eggs on so, 1 1st instar larva. Definitely host.

Station 44. Loby Summit on rts. 11, 10 mi. n. of Elko, Nev. Elev. 6554 ft. A fulvous lupine apparently not same as any last few days. Sample pressed. 4 eggs. Large black Elaterid. Total 7 hatched, 7 unh. At mileage 11830 (60 mi. from Elko) crossed the divide into the Columbia River drainage from the Humboldt River drainage. Elevation 6438 feet. Lupine has followed us from Sta. 44.

From Elko we followed rts. 11, but the newer route 43 and 11A parallels this and we followed it. The mountains are less rugged but are all around. Wildhorse Reservoir is partly in an open valley and partly in a narrowing canyon. Very attractive. Brown rocks appear to be basalt.

Stopped in Mountain City for supper. Saw a new motel and decided to stay. Chevron Motel. We were first ones in Room 1, just finished. Twin double beds for \$8.00. Room 2, has 1 double and 1 single. Very nice for such an out-of-the-way place.



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RUBY VALLEY, NEVADA

Speedometer 11860

Station 45. Mountain City, Nevada. Elko County.

1 large Carabid, 1 *Pantomorus* weevil.

June 30. Were told that Harris Gulch behind town and Thars also rde. 11 4 mi. south had two kinds of lupine. Will investigate. Sent cards to Woodie, Mary Ann, Frizzelli, and Arnett's.

Station 46. Harris Gulch, 1/2 mi. e. Mountain City, Nevada.

Elev. 5575 ft. Many blues, 3 *Memnathines*, sample of lupine but only 2 eggs. Marked "probable host"!

Station 47. Speedometer 11874, rde. 11 A 10 miles. s.w. from rde. 43, 14 mi. from Mountain City. No lupines although everything looked right. Green Meloids, gray Meloids, couple of blues but not *icaroides* Clerid.

Turned back to Mountain City for lunch at the Miners' Club.

Proceeded through the Western Shoshone Indian Reservation into Idaho. (Rte. 51 Idaho).

Station 48. 14 mi. s. of Grasmere, Idaho. Elev. 5800 feet.

Speedom. 11933. Lupine sample. A few eggs.

For about 50 miles this is the most barren desert we've seen. Low hills with slight tendency to form mesas, sandy soil, no flowers, not even sage most of the way. Passed a missile base under construction. Road not paved and very dusty.

Gas at Mountain Home on US 30.

Decided not to go to Boise, so took US 30 east to Bliss, paralleling hills on the north that seemed to be capped with lava. A sign among the sparse sagebrush said, "Sagebrush is free, stuff your car with some." From Bliss east to Shoshone and then north. Here we crossed real lava flows, very rough. Saw very saw-toothed mountains ahead and to the right, but they can't be the Sawtooths. Stopped at 2nd class motel at Hailey.

Lycaenidae from Harris Gulch, sta. 46:

Plebejus icarioides 12 ♂♂, 6 ♀♀
P. melissa ♂♂
P. acmon ♂ ♀ very common
Phaedrates piasus ♂ ♀ most numerous
Lycaena heteronea 1 ♂
Philotes battoides 1 ♂
Satyrium fuliginosum 1
Plebulina emigdionis 1 (? new state record)

Other Lepidoptera:

Cercyonis sp.
Colias sp.
Euphydryas sp. (maybe 2 spp.)
Coenonympha sp.
Phyciodes sp.

Speedometer 12129

July 1. Breakfast at Ketchum, entrance to Sun Valley. 4593

Fri. Station 49. 9 mi. n. Ketchum, 6300 feet, on rte. 93.

5 eggs on lupine. Little flying. 1 coccinellid and 1 chrysidid. Lupine sample - host.

Station 50. South of Talena Summit on US 93.

Elev. 8500 feet. Speedometer 12174. Many large green ^{on lupine} *Lytta*, 4 spp. blues but not common on this wind-swept hillside. 2 *icarioides* stalk eggs per 100 stalks. 3 *ligdamus* eggs per 75 buds (mostly partly in flower). Some of the lupines almost pure white, stalks often a foot long, large open clumps. Also *Eumenes* *cameratus* & *Phaenocarpa*. Samples of lupine of both white & pink flower. Seem to be same. Two large reddish *Elaterids* on lupine. 2 ♂ + 2 ♀* of *icarioides*, one female kept alive.

Drove over Talena Summit and down into valley along east side of Sawtooth Mts. Up to Alturas Lake and a half mile beyond. Ate picnic lunch.

Speedometer 12192.

Station 51. . miles w. of US 93, just above Alturas Lake. (150, 28)

4 large Tabanids. 2 *Aeneis*, 4 ♂ *icarioides*, 2 lupines present & collected, A+B, B is hairy & John feels it is the host. He took 2 ♂ + 2 ♀ in obvious association with it. More than 50 stalks examined without any eggs. *S. A.* uncommon, about 20 stalks - no eggs. *Brentus* (*Bolaria*) 2, *Plebejus sapius*, *Lycaena rupreus*, 1 Clerid, 1 Cerambycid, few others. (cont. over)

Continued to collect down to the lodge, 4 miles, taking additional males. Several *Aulids*. Collected two more lupines, C in a dry pasture, D a very low sparse plant down in the flats.

Station 52. 9 miles west of Stanley, Stanley Lake, end of road, northwest corner of Sawtooth Mts., Idaho. 6500 ft. elevation. 9 ♂ + 4 ♀ *icarioides*, 1 *helioides*, 2 spp. of *Cerambycid*, 1 saw fly, 3 robber flies. 115 eggs. The lupine here was very variable, sometimes being wide-leaved and pubescent, sometimes narrow and glabrous above, sometimes stalked and sometimes with leaves growing from base directly.

Many *Phalaenid* moths flying among the flowers. They made it difficult to spot the blues.

We drove through some rather fantastic country today. Sawtooth Valley is broad and long with many lateral moraines coming down out of the Sawtooth Mountains, each heavily forested with pines. The east side of the valley looks like a continuous series of landslides, but looks also like the terminal moraines of all the glaciers, with the flat central valley the result of stream erosion. The rock seems to weather quickly, but the hills that are bare have a topography that looks like no stream erosion pattern.

The valley is drained to the north by the Salmon River. The road goes down this canyon for 50 miles or so. This canyon alternates rough & craggy red and brown rocks that are sometimes stratified but upturned and folded on a large scale - and the barren hillsides, rounded and hummocky. There are a few cliffs but many very large talus slopes. The canyon bottom is narrow and winding, the stream large and swift. Rocky knobs protrude from the rounded hills and only the high peaks have pine trees, - the rest have an alve, greenish, or yellowish tinge to the brown, no sage, and apparently little other vegetation.

169 mi.

July 9. Station 53. US 93 7.2 mi. n. of Gibbonville, Elev. 7525 ft. Sat. Below Lost Trail. 18 ♂ + 8 ♀ of *icarioides*. 1 *Clerid*, 4 bugs, 2 *Agrilus*. 23 adults. 2 sawflies on lupine.

Station 54. US 93, 3 mi. below Lost Trail Pass. One yellow *Cerambycid* on large *Thalictrum* heads. Also a *Clerid* and a *Coenonympha*.

Station 55. 6.7 mi. n. of US 93 on Twin Lakes Road. Elev. — feet. Adult *icarioides* Larby, Montana, a few eggs elev. feet. Lupine in marsh.

"Lost Horse Road No. 429"

Station 56. 6.7 mi. w. US 93 on Twin Lakes Road. ~~At~~
Elevation 4250 feet. Adult icarioides (21 ♂ + 4 ♀),
Plebejus argyrognomon ♀, P. sapiolus, Erebica,
Bumblebee-mimicking robberfly. 3 females kept
alive. Heterocera californica. This lupine extended 2 miles,
200 feet elevation.

Station 57. 2.2 mi. east (down canyon) of sta. 56.

Elev. 4075 ft. Broad-leaved and very hairy silver
lupine. 2 eggs on 15 stalks. 6 adults (3 ♂ + 2 ♀)

Bumblebee and fly similar to it. Large yellow jacket.

Station 58. 4.4 mi. east (down canyon) of sta. 56 or
2.2 e. of sta. 57. Elev. 3900, out of canyon on alluvial
fan or moraine. (Seemed to be same as at 56.) A large glabrous lupine. Took
samples and pods. No eggs, no adults. 3 Eleodes on road.

Saw a large badger, big face black and white
and furry. He was digging a fresh hole.

Today we followed US 93 from Challis, Idaho, on
down the Salmon River Canyon to Salmon and to
North Fork, where the river turns west and the
road turns up the North Fork of the Salmon River.
At the top crossed over Lost Trail Pass into Montana and down
into the Bitterroot Valley. Went up a side road
west into the foot of the Bitterroot Mts., then on
to Hamilton (Rocky Mt. Lab. of USPHS) and Missoula
(Montana State University). Stopped at the
Gears Motel on south side. All bottles filled up.

Blues, not identified — 7, 8

Lycaenidae:

Plebejus icarioides — ^{72, 73, 76, 78, 80, 83, 85, 86, 87, 88, 89, 93}
^{SL} 4, 11, 13, 14, 17, 18, 21, 34, 38, 39, 41, 42, 46, 50, 51, 52, 53, 56, 57, 61, 62, 63, 64, 66, 67, 68, 70, 71,
melissa — ^{SL} 19, 21, 22, 30, 38, 39, 41, 43, 46, 61, 63, 67, 68, 70, 72, 75, 78, 79, 80, 81, 82, 83, 88, 93
acmon — ^{SL} 25, 46, 62, 66, 70, 72, 73, 76, 84
sapiolus — ^{SL} 51, 56, 60, 61, 68, 71, 72, 73, 79, 80, 84, 85, 86, 88, 93
argyrognomon — ^{SL} 56

Phaedrotus piasus — ^{SL} 4, 11, 22, 39, 46, 50, 61, 63, 66, 67, 70
Glaucopsyche lygdamus — ^{SL} 4, 11, 24, 66, 67, 68, 70, 71, 84, 85, 88, 92, 93
Lycaena bellus — ^{SL} 39, 52, 70, 92
cupreus — ^{SL} 51, 68
heteronea — ^{SL} 47, 46, 62, 67, 70, 72, 73, 80, 83, 87, 92
editha — ^{SL} 62, 73, 80, 83, 86
rubidus — ^{SL} 76, 80

Lycaenopsis pseudargyroides — 11

Callipsyche behrii — 25

Strymon melinus — 19, 21

calanus — 39

titus — 39, 62

Plebulina emigdionis — 46, 79

Callophrys sp. — 20

Satyrus fuliginosus — 39, 41, 46, 70, 73, 78, 87

(Phyciodes) sp. — 20

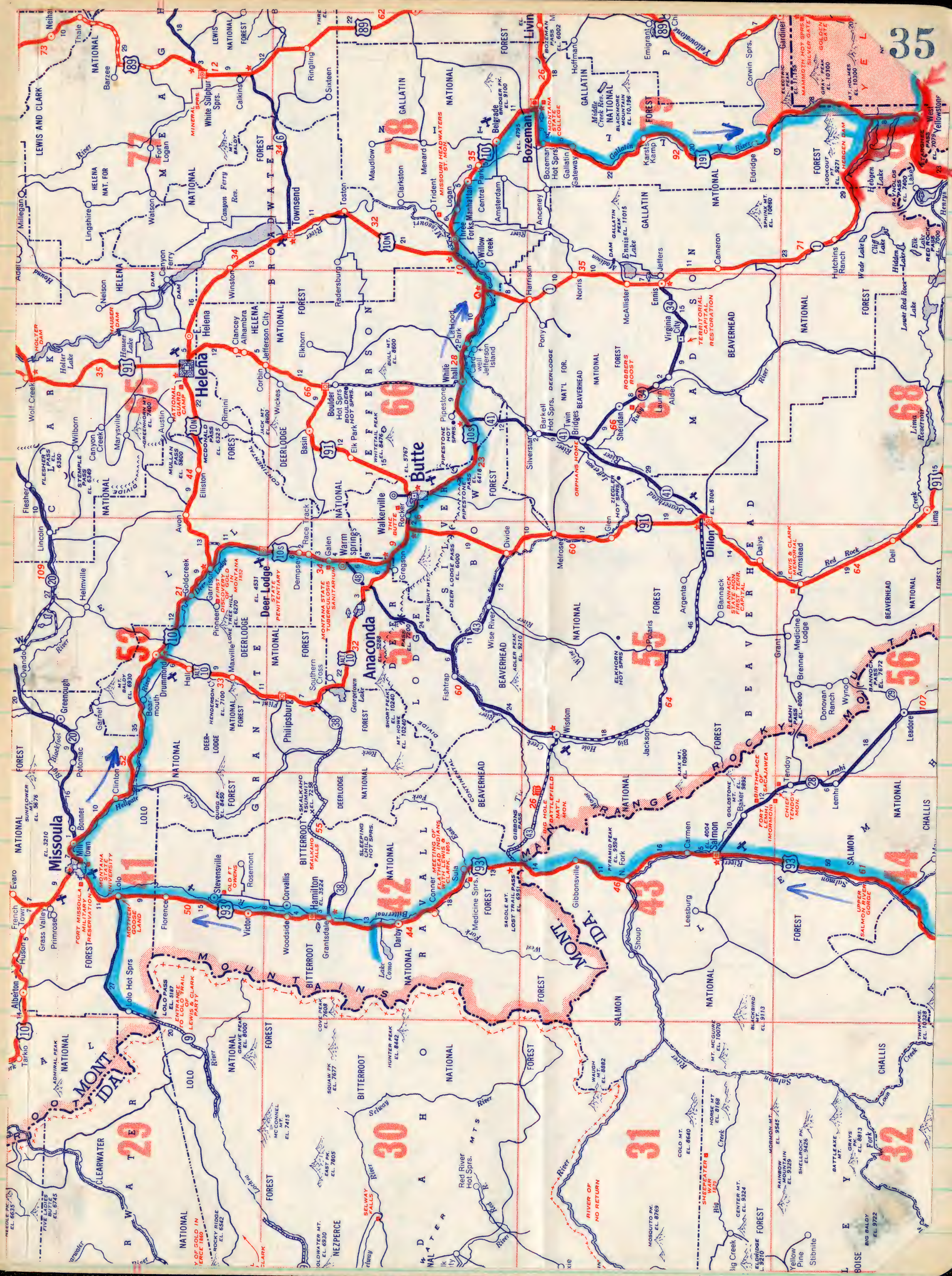
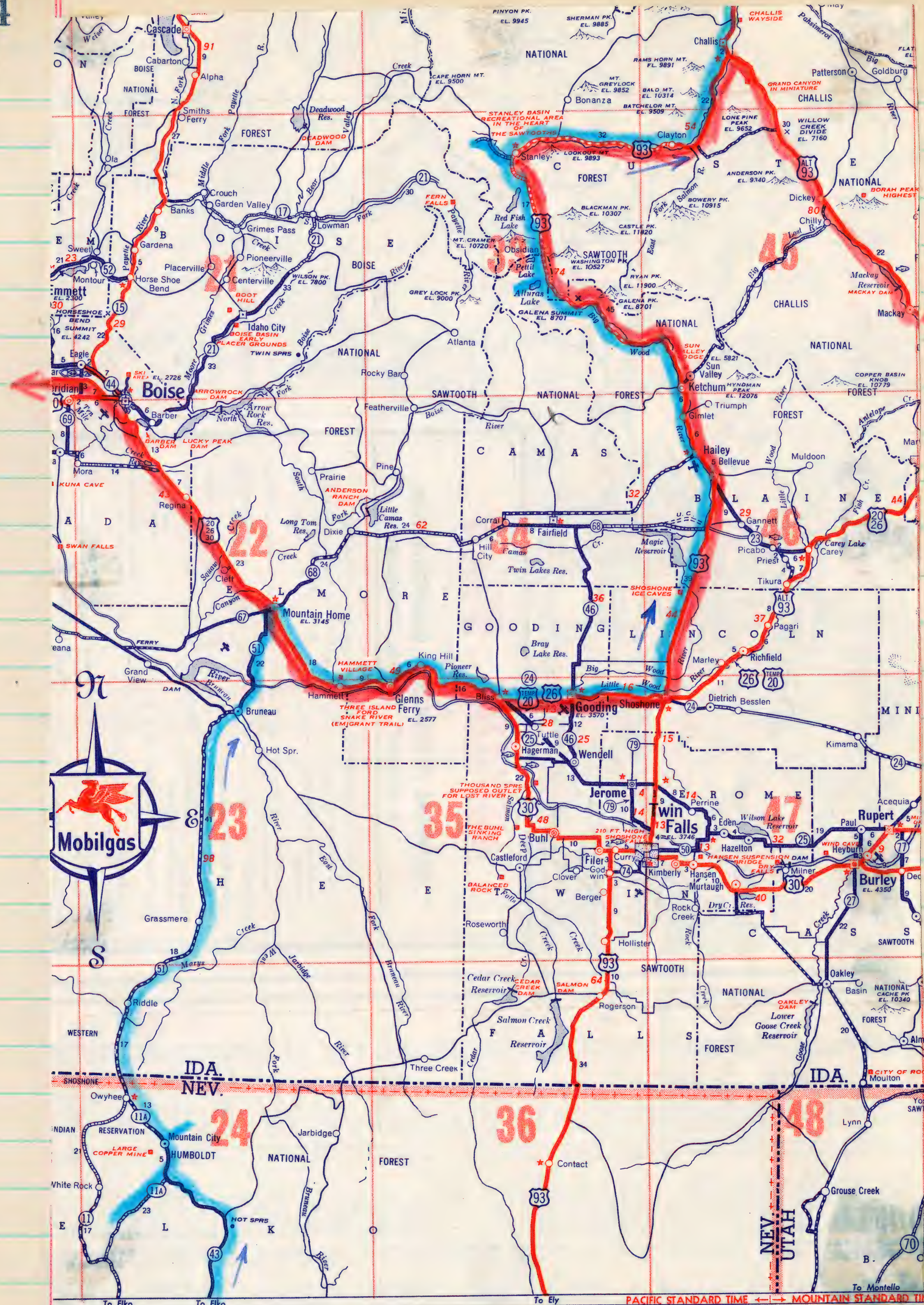
Philotes batoides — 21, 25, 29, 46, 67, 70

Everes comyntas — 21, 24, 29, 50, 68, 79, 84, 85

Agriades glandon — 68, 72, 88, 93

Mitoura siva — 30

Sp. — 85



July 3. Station 59. Tolo Pass, Bitterroot Mts., elev. 5187 feet.
 Sun. 1 Cicada, 1 Stratiomyid, 1 Bombyliid, several Syrphids,
 Carabids under stones, Amaliinae on flowering shrub
 1 Clerid, 2 Chrysomelids. 2 Polygonia, 2 ^{light} white,
 1 Aglais milberti. Only 2 or 3 lupines.

Station 60. 4 mi. e. of Tolo Pass, Bitterroot Mts. elevation
 4200 ft. 5 *P. sapius*, 1 *Erebia*, 2 yellow *Colias*, 2 *Agrilus*.
 Lupine scarce & only around wet bank.

Station 61. (17 mi. e. of Tolo Pass) 5 mi. n.e. Tolo Hot Springs.
 Elev. 3700 feet. Excellent general collecting. Cicadas
 Clerids, golden Cerambycids, mayflies in alcohol. 4 eggs
 and many adults of *icarioides*, *piceus*, *sapius*, and
melissa. *Colias*, *Euphydryas*, *Phyciodes*, *Coenonympha*
 Red Elaterid on lupine, green click beetle, green *Buprestis*.
 Lupines abundant on very steep slopes among
 dense pine & many *knirich*.

Station 62. US 10, 40 mi. e. of Missoula, Bearmouth,
 Mont. 3900 ft. level. Few eggs, all on upper leaves
 and top side. Many lupines in open fields, 11 ♂ 20+ ♀
Strymon tatus, *Tycaena heteronea*, *P. acmon*, 3 *Coccinella*.
Tycaena editha. 2 *Asilids* with white abdomen,
 2 *Myrmelionids*, 1 assassin bug.

Along the Tolo Pass Road we saw a young moose
 and a deer. Also a grouse family in the brush,
 with the mother scattering through the grass
 to lead me off at right angles to the others.

Station 65. Bozeman, Mont. 1 black & white *Cassid* moth on ^{shrub}.
 After the side trip to Tolo Pass, we returned to
 Missoula for lunch and then started for Bozeman
 via US 10. Stopped only for sta. 62 and arrived
 in Bozeman at 10 p.m. without supper. All motels
 filled, but got a ground floor hotel room with
 a bathtub (!) in a hotel, and a snack in a
 "greasy spoon."

July 4. An early start was delayed by finding 160 eggs
 Mon. laid overnight by live females. These had to be
 isolated and packed for mailing.

Wrote letters to Karen and Ruth during breakfast,
 then realized the P.O. would be closed. This will
 endanger all the eggs. (Not in barrel door and just caught a plane.)
 Elev. 5000 ft.

Station 63. 20 mi. s. of Bozeman, Mont. 2 mi. s. of ^{Gallatin} Highway.
 Open roadside pasture, much lupine, a few eggs,
 12 ♂, 18 ♀ *icarioides*, *melissa*, *Phaedrotes piceus*. #2
 kept alive. Clerid, Reduviid, Bombyliid, Coccinellids,
 yellow Cerambycids.

Gallatin Canyon is near the place that had the
 bad earthquake, flood, and landslide last year.
 We may be able to go up and see it. This is a very
 pretty pine covered V-canyon, beautifully green,
 with nice green flats, a roaring river, rocky
 cliffs occasionally. (Got a book instead, with
 photographs from many sources, and will send
 it to EB.)

Station 64. West Yellowstone, ~~Idaho~~ Montana.
1 ♀ *icarioides* and a Coccinellid on sidewalk center of town.
(The latter in with sta. 66.)

Station 65. See top of p. 37

Elev. 6650 ft.
Station 66. 1 mi. n. of West Yellowstone, Mont. on Rt. 191.
Small pines with much lupine, extremely variable
or mixed species. 50± Eggs, ♂, ♀ *icarioides*,
"Two main spp. of lupine occur here. The host plant appears
to be quite variable, in flower color, hairiness, and size
of leaf. Samples of some of these variations were taken, but
eggs were found on all hairy varieties." 37 eggs/180 stalks
Of non-host lupine, no eggs/150 stalks examined.
Other Tychiidae: *Lygdamus*, *acmon*, *piasus*.
2 black Meloids, 3 small brown scarabs, 1 Chrysomelid.

This was not the locality we were heading
for - Red Cliff Forest Camp. We missed that one
coming down, and the ranger station says it's
41 miles n. of West Yellowstone. John got many
eggs at Red Cliff last year but no or few adults.
At sta. 66 we got the minimum sample of adults
(♂ and ♀) and at least 50 eggs, as well as 3
live females which may produce more eggs
for us overnight.

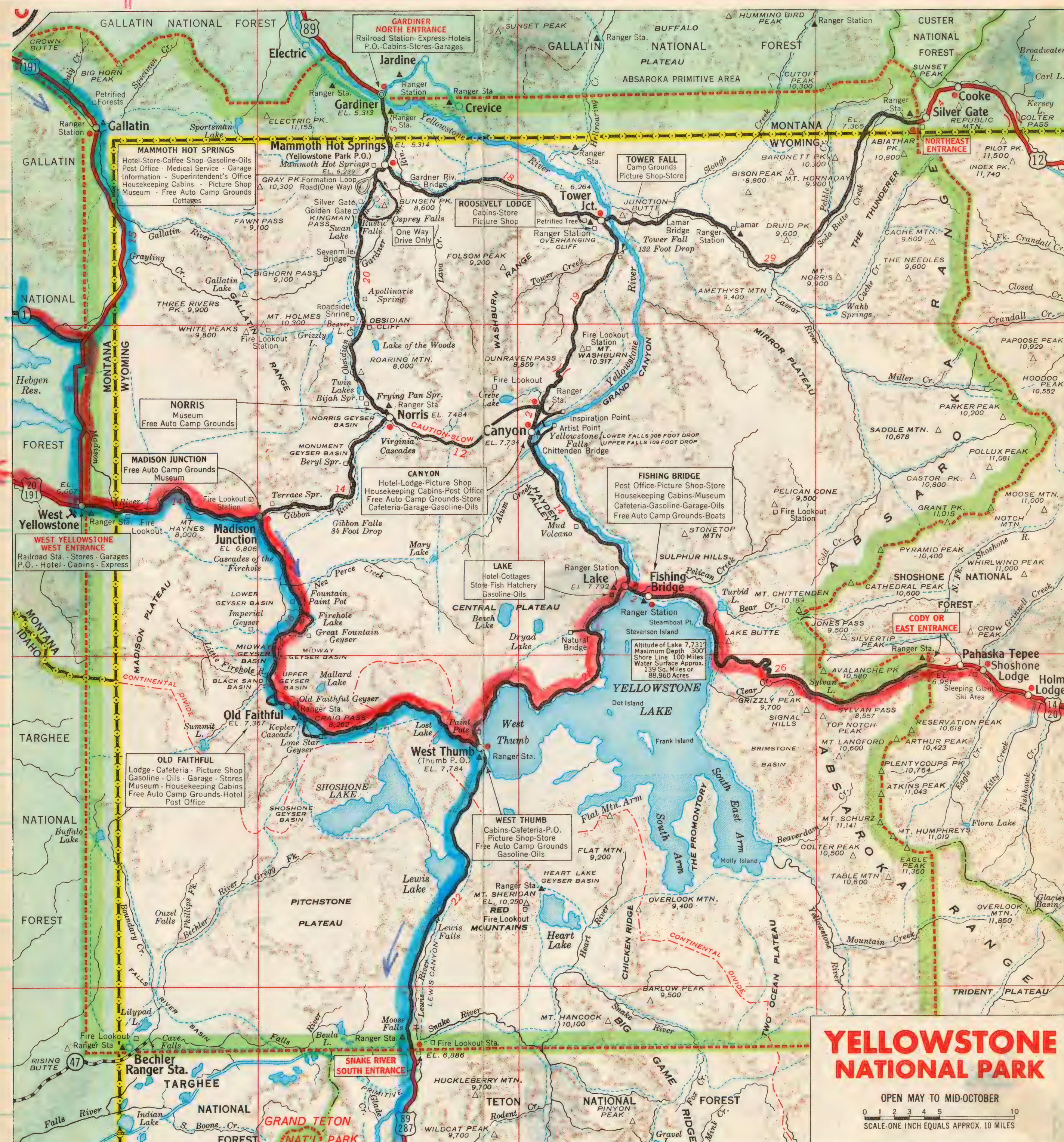
100 mi.
We got a motel before going out, to be sure that
they weren't all taken, but the exodus is now on
and we probably needn't have worried. At 4:30
it began to rain, so we came back to town, got
haircuts and the camera fixed, looked at a
dozen curio shops, had the car oiled & greased, and
had two chicken salads for supper. Speedom. 12911.

Total eggs shipped home so far = 1040.

July 5. With the holiday over things are quieting down.
Tues. The "shooting" kept us awake a while last
night. Put a batch of laundry in a laundromat,
so have an hour to kill and will run out to the
1959 earthquake & slide area.

Station 67. Hebgen Reservoir, north side, 20 mi. n.w. of
West Yellowstone. *Carabus* on road. Many lupines
and many blues flying. *icarioides*,
melissa, *piasus*, *Lygdamus*, *bathoides* & *Tychaena heteronea*,
Speyeria, *Parnassius claudius*, *Erebia*, *Coenonympha*.
Tachinid mimicking bumble bee, 2 Crambids. Eggs
12/24 5/33. Lupine sample.

The road to quake area was temporarily closed.
Photographed a large rift which fell 20 ft. wide
10 ft. or upside, leaving gaping cracks yet. We
did pass several miles of smaller "fault scarps"
which also have been mostly cracks. Also one of the
three large breaks in the highway, where it
collapsed into Hebgen Reservoir.



El. 6975 ft.

Station 68, 3 mi. up Red Canyon, n. of rte 1.
 Narrow valley in pine woods, many flowers incl. lupine. *Scorpioides*, *Lygdarnus*, *melissa*, *Agriades glandon*, *Lysena rufipes*, *Eures comynfas*. also *Anthocharis sara*, *Euchlaena ausonides*, *Erebia* sp., *Aeneis* sp., *Polonia* sp., *Pieris napi*, *Satyrus* sp., *Physiodes* sp., *Speyeria*, *Parnassius clodius*, *Polygonia satyrus*. Only 1 *Scorpioides*, many others.

92 blues altogether

In this same side canyon west of the main Red Canyon, we saw a grizzly bear on the hill-side. Had a light hand over the shoulders. He looked at us when we whistled but there was no alarm. The high centers and rocks in the road made driving this very low car difficult. Several very large boulders obviously came down during the quake.

Up on open steep flower-covered hillsides, I thought that the open ground between the plants, due to creep, was more evident than usual. Might have been imagination.

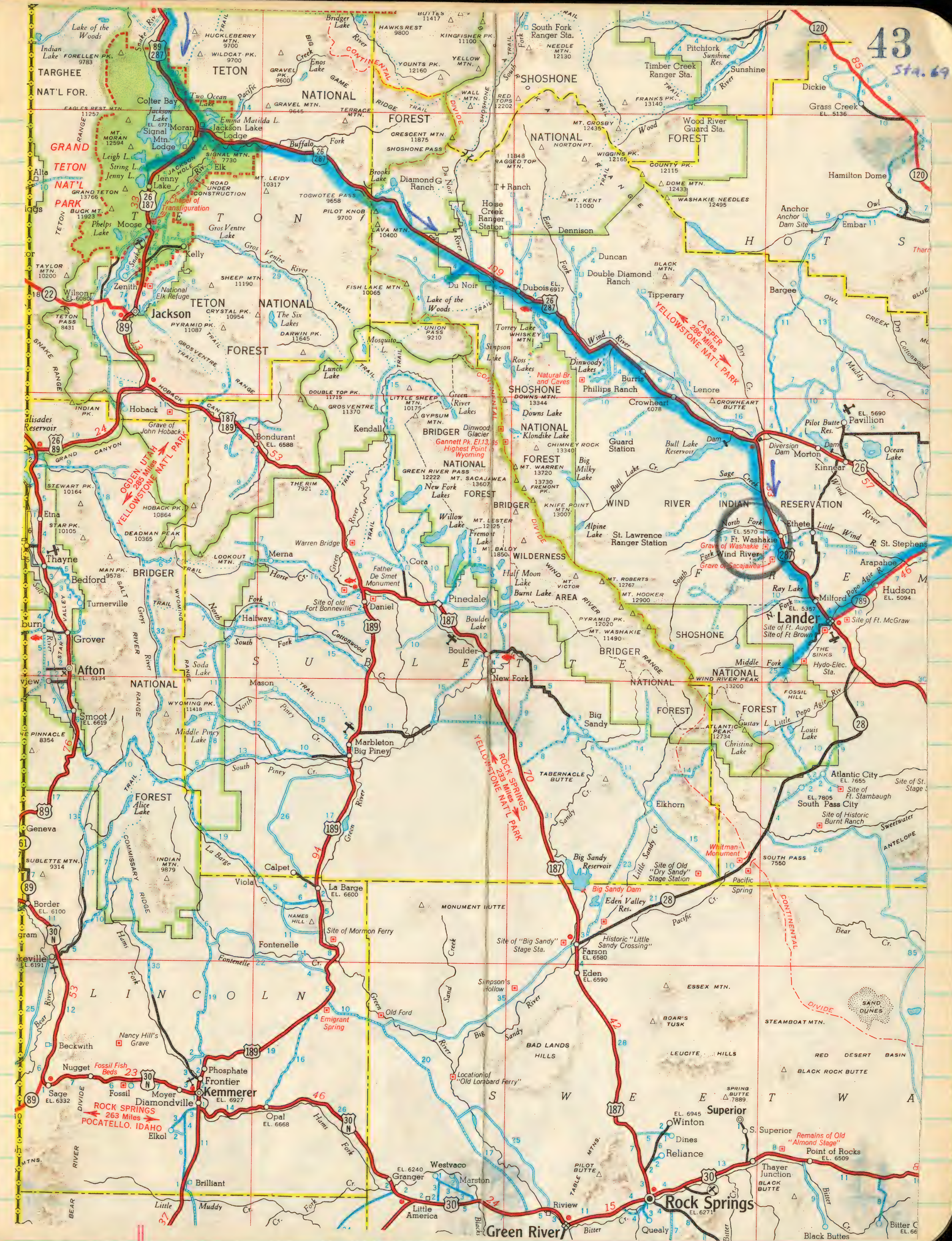
Half a mile above where we stopped, there is a large yellow gash running across an open mountain face several hundred feet above the valley. There were so many trees that we couldn't get a photo, and so many blues we didn't have time to explore. Called Red Canyon Fault Scarp.

While papering blues, a Floyd Robinson from Marion and Mr. Addison from Carbonate came up to say hello.

Station 69. 2 mi. s. of Snake River South Entrance to Yellowstone National Park, Wyo. Elev. 6750 feet. Been raining. Two lupines, only one hairy - if on drier slopes with sage brush. Non-hairy, glabrous, common on flats under pines, white, ~~pink~~ purple. Hairy on hills pinkish. Samples pressed. 3 green Typha on the non-hairy lupine. 7 eggs. 4/13 stalks.

Started about 3 p.m. to cross Yellowstone Park to visit one of last year's localities at the south gate. As above, too wet after a shower. Went on into Grand Teton Park, stopped at Colter's Bay on Jackson Lake. Drove down to the Marina and spotted an old friend of John, Mike Duers, whose father we had stopped to see. They have a very large cabin cruiser, but just had an accident and had the boat on a trailer ready to take to Jackson for repairs.

In Yellowstone we made no stops, but saw many black bears, many foolish people feeding or harassing them. John took a nap and stopped momentarily by a sandy cub, who put his feet up on the car and John woke to see the bear face in his. Also saw elk, but no moose.



At Colter's Bay we went to get a cabin - \$15. each! So we looked at the tent houses - \$5.00 with no screening but bunks with foam mattresses. We got the last one. Then went back down to watch them put the boat back in the water to adjust it on the trailer. Took only half an hour, although it had to be done with a long chain so the car could stay out of water.

Had supper at the large cafeteria with the Ivers's and Mike's girl friend Norma. While the rest had a beer, Mr. Ivers and I stood outside and talked. He had been in the Sawtooth Valley in 1903, had mined in many of the mountains, and now lives on a 24 ft. cruiser - Lake Meade in winter, Jackson Lake in summer. He once hired a man who had driven a wagon from Salt Lake to Yellowstone and the Tetons in 1884, painting water colors all the way and keeping a journal, a copy of which he had given to Mr. Ivers. Ivers was until recently a member of an exclusive hunting club owning many thousands of acres of marshland around Bear River in northern Utah. The members were all millionaires - mostly multimillionaire oil executives, - Ivers said too rich for his money. But he was president of it just before he got out. The members mostly flew in in private planes, getting two days hunting per week end.

July 6.
Wed.

Station 70. Spring Lake, Grand Teton National Park, Wyo. Elev. 6750 ft. Two species of lupine - the host silvery pubescent, the other glabrous. ^{1 line 2} *Icarisides* but few eggs, *lygdamus*, *piasus*, *melissa*, *acron*, *heloides*, *heteronea*, *bathoides*, *Sat. fuliginosum*, 4 cicadas, 3/50 and 2/25 egg/stalk count, other Lepo = *Coenonympha*, *Anthocharis*, *Satyreus*, *Euphydryas*, big brown buck moth, *Parnassius clodius*.

Stopped at Moran PO, all that's left of Moran, 1/4 mi. east of turnoff of ^{east} sts. 26 + 287 and 187 + 26 south. About 15 miles farther east stopped at the Hatchet Restaurant which is quite nice and has a large attractive motel, Standard gas, and store. This is called Moran, Wyo.

Crossed over north of the Wind River through Togwootee Pass, 9658 ft. elevation. Speedometer 13172. Saw a young elk, the first outside of the Park. About 20 miles back, saw a coyote crossing the road. Looked awfully rangy.

Station 71. 3 mi. east of Togwootee Pass, elevation 8500 feet. Glabrous lupine, 1 egg only. *Icarisides* ♂ + ♀, *lygdamus* abundant, *sapiolus*, *Anthocharis*. It was sprinkling fitfully, apparently the remnants of a shower on the west slope. Sample of the lupine, which grows very dense, is crisp and entirely glabrous.

Coming into Dubois, there was plenty of sage but little or no lupine. Reddish + yellowish beds appeared on the northwest side, no vegetation and considerably carved. Almost badlands. The most craggy ridge of the trip was on our left as we crossed the pass, and the back side of the Wind River from Dubois is rounded, drab, and forested only in spots.

Elev. 7650 ft.

Station 72. 3 mi. w. of rte. 26/287, road to de Noir. Lupine host but not very hairy or silvery. ⁽¹¹⁾ Two eggs, *icarioides* 8 ♂ 5 ♀, *Agriades glandon*, *acmon*, *melissa*, *sapiolus*, *T. heteronea*.

195 mi. Passed a lot of bad land country getting to Tander. Browns, reds, and greens. Sage sparse but dry, without lupine. The hills to the west appear to be sloping strongly away from a jagged crest, as on the south side of the Uinta Mts. It must be twenty-five miles back in to the real base of the Wind River Mts.

Tander is a strange little town of a couple of thousand people, serving the Wind River [Shoshone] Indian Reservation. Has several AAA motels, a Duncan Hines hotel (Noble Hotel) with coffee shop, five drug stores, a wide divided main street, a rodeo, and some real Indian artifacts among the trinkets. Coffee shop has interesting murals and historical objects. - also Indian signs.

July 7.

Thurs.

Left Tander to make a side trip into the south-east corner of the Wind River Mts. up Middle Fork.

Station 73. 12 mi. s.w. of Tander, Wyo. Elev. 7000 feet. Sinks road. Lupine very old, few eggs. Adults plentiful on dusty road. *icarioides*, *sapiolus*, *acmon*, *T. editha*, *Satys. fulig.*, *T. heteronea*. 9 cicadas, dark *Cicindela*, 1 Clerid, 1 Tephrochid. Egg count 1/33.

Seeds collected.

Northeast from Tander to Riverton, then past a fairly new reservoir in the badlands south of a range of hills made of tilted beds. Found that the Wind River runs out through these hills in a sharp rocky canyon.

Station 74. 6 mi. s. Thermopolis, Wyo. Elev. 4400 feet. Crambeid on milkweed, a Megachilid, a *Speyeria*.

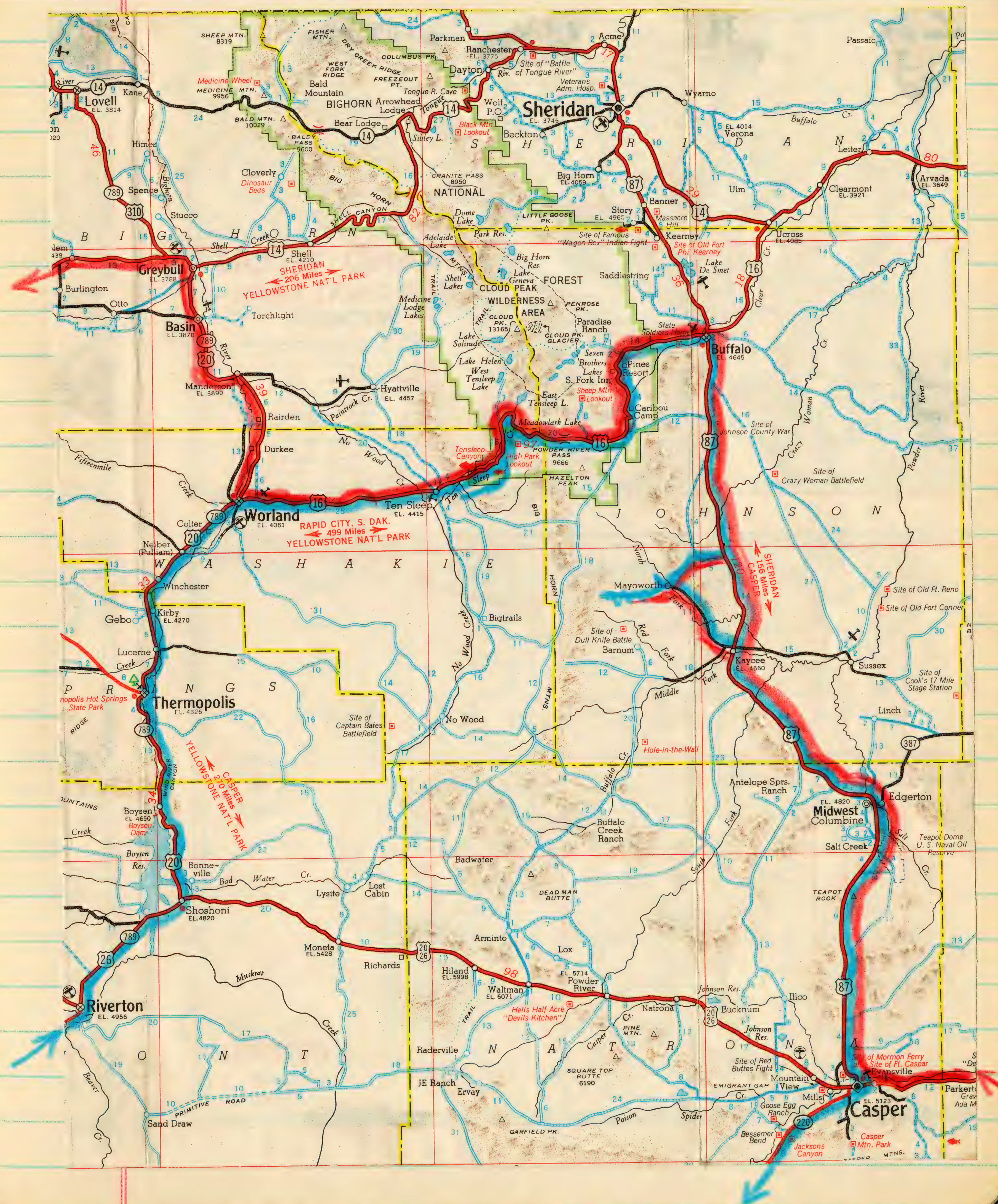
This is at the point called Wedding of the Waters, where the Wind River and the Big Horn meet, or rather the stream is called the Big Horn after it leaves the Wind River Canyon.

We've been following rte. 789 from Tander and US 20 from Shoshoni, and will turn east on US 16 at Worland.

Station 75. Ten Sleep Canyon, Elev. 6300 feet, 10 mi. e. of Ten Sleep, Wyo. Glabrous lupine very scarce but found 5 eggs out of 55 stalks examined. No adults of *icarioides* in spite of eggs. 2 *melissa*, *Polygonia*, *Pieris hysanthea*, *Satyra*, *Phyciodes*, 2 black-and-white moths. 1 *Ceanothus* (small), red thorax *Meloid*, *Elephanta*, small black *Coccinellids*, *Asilids*, 2 *Cicadas*, small tree hoppers & *Orthoptera* (on *Ceanothus*) flies on thistle. Went back down the old road for 5½ miles; it is on the other side of the canyon (south or east) and is in good repair. Saw only one or two lupines.

Station 76. 2 mi. above sta. 75. Elev. 7725 feet. Lupine abundant, but there was rain here within the hour and only 3 blues were seen, - 1 *icarioides*, 1 *acmon*, *Typhaena rubidus*. 1 *Speyeria*, 3 *Corydalis*, and a black larva under a hot cat skin. Lupine sampled.

Today we saw buffalo (bison) near Worland, and a fearless doe in Ten Sleep Canyon. No pronghorns. Continued on over the pass, 9,666 feet, and found lupine in prime condition in great profusion under pines. It continued thus for about 15 miles. Then occasional lupine, perhaps of one or more other varieties, right down into the flat at Buffalo, Wyo. Town of 2600, at 4600 elev. Stopped at Mountain View Motel (cabins) AAA. In the evening we made the rounds of the



bright lights, literally, to see what insects were flying. The only good place was a white Dairy Queen next door to the motel, where —
 Station 77. Buffalo, Wyo. 4600 feet elevation. At lights, 1 large black and white moth, an Ergates, 1 Polyphylla, 3 Trax, many Trichoptera, and 2 Ephemeroptera, 1 Meloid-black Epicaur.

July 8. Up early, card to Ruth at breakfast, book partly full of 54 green stamps to John's mother, then on the road at 7:30 for quick trip back into The Big Horns.

Station 78. Clear Creek Canyon, ^{elev. 6300 ft.} 9 mi. w. of Buffalo, Wyo. Lupine along road only. 1 egg. 3 icarioides, melissa, & fuliginosum kept alive, also 1 icarioides ♀, 1 Speyeria, Cerambycids, black Meloids.

Station 79. Elev. 7150 in ^{14 mi. up} same canyon. Many blues especially melissa, E. comynodes, Typhaena hypophlaea, (icarioides) sapiolus, P. amygdionis. No lupine sample.

Station 80. 20 mi. w. of Buffalo, ^{12, 13} same canyon, elev. 7700 ft. A standard sample of icarioides but we had to struggle to get it. No eggs. Many small Cerambycids, 2 Cicindela, 2 Clerids, 1 Agilus, 1 yellow & black Cerambycid, a Hymenop. + 1 ♀ icarioides kept alive. Also 1 ♀ editha. I. rubidus, I. heteronea, sapiolus, melissa. Erebica, Speyeria sp., Papilio.

Station 81. 4 mi. n. of Mayaworth, Wyo. 11 mi. n. of US 87. Elev. 5650 ^{ft.}. Sagebrush hills one mile out from ^{s.e.} spur of Big Horn Mts. (southern section). Few lupine on southeast slopes & gullies. No eggs, no icarioides, 1 ♀ melissa, 6 black Cerayonis. Lupine sample + pods collected. 2 Carabids on ground. 0/50 stalks.

On the back of one of the hogbacks at 5675 feet on the western branch of the road, and a side road into the red beds, crossed a hill of slate-like but cherty beds, all broken off in flat pieces. No fossils.

Where this road meets the end of a paved road, there is another gravel road turning west. After half a mile or so this swings back to the northwest, evidently heading up the valley between the spur and another section of the Big Horns. Just as the red beds appear, there is a road keeping due west. It passes over the slaty beds described above, over the escarpment of the red beds, across a valley, and up a ridge by means of 22 switchbacks. We probably didn't get near the top, very steep and rough. Canyons on each side of the ridge; pine trees, no lupine. Beautiful view each over hogbacks. The red beds evidently underlie the northern section of the mountains and overlie the southern. They were also seen at the west entrance to Ten Sleep Canyon.

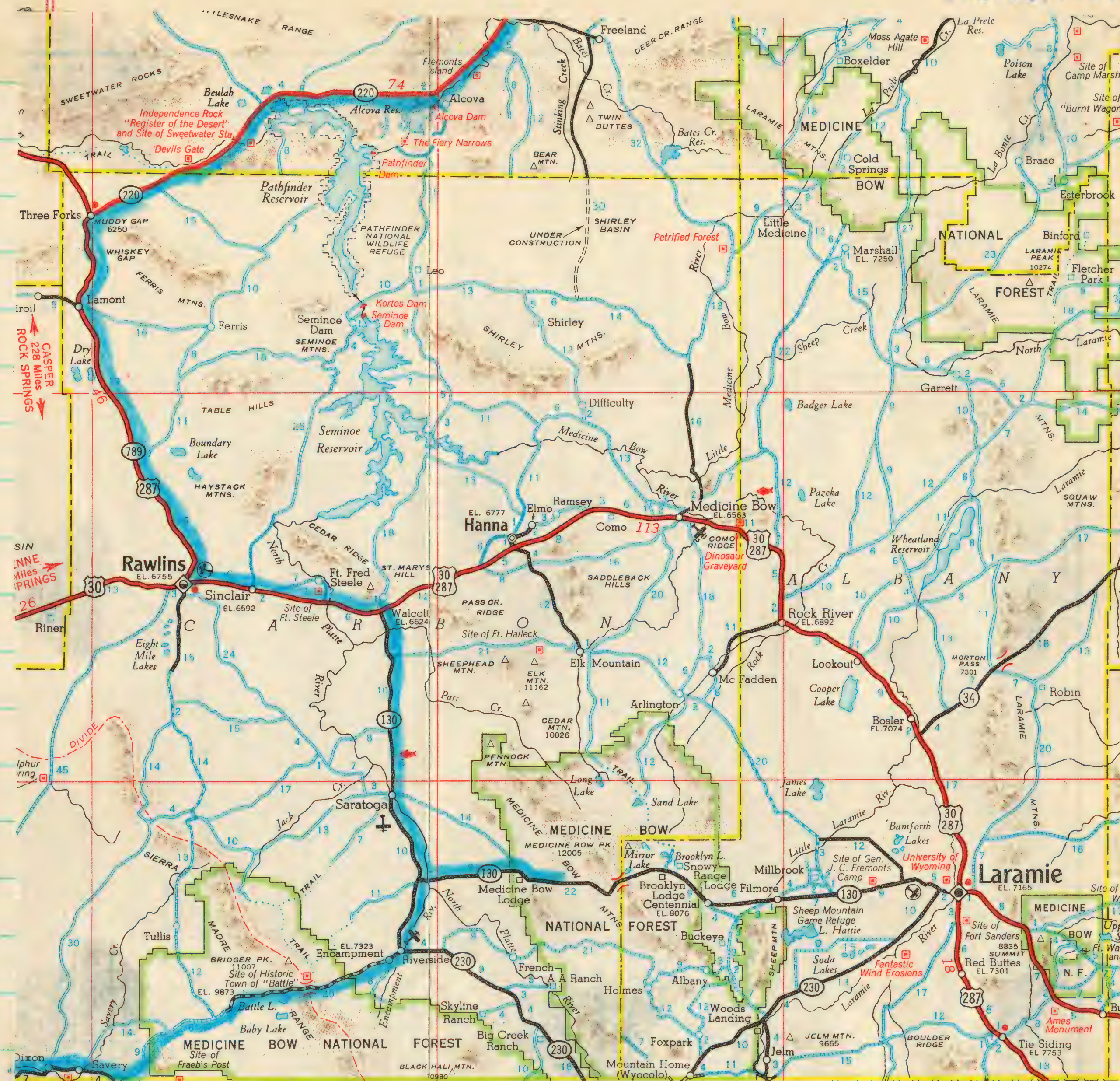
Station 82. 10 mi. n. of Mayaworth, Wyo. Elev. 6850 ft.
 Melissa, 1 gray *Epicauda*, ^{green} dragonfly, black-and-red
 Meloid, house fly, Hymenopt, Apterid.

At Midwest, down US 87, we came upon an
 extensive active oil field, and just south of
 this passed Teapot Dome and Teapot Rock.
 Shortly thereafter we entered a region of
 sharp craggy hills sticking out of prairie.
 They look like intrusive blocks left by
 erosion. In the south background were more
 extensive mountains.

Casper is on the North Platte River on the north
 flank of an east-west range of hills. It has poorer
 road signs than any town we've seen. It's not
 on any tourist route, but it's a small city.

Southeast of Casper we passed Independence
 Rock, which is a very large exfoliated dome, appa-
 rently granitic (sign says feldspar and mica)
 with the "foliae" 12-15 inches thick. It is now
 fenced off, with several historical plaques. The
 mormons came by here, and many others in the
 early days. Nearby is Devil's Gap, a short cut
 made by the river.

After a region of rolling bad lands, we
 came through a low pass between the Ferris
 Mts. and the Green Mts. (to west). On the south
 face of Ferris Mts., just outside of Whiskey Gap,



were a row of hogbacks, very steep, over 45° I think,
 with the south slope composed of a smooth sur-
 face all in one plane. This surface is cut up into
 square blocks like pavement. John took two
 photos. Many pronghorns along here.

In Rawlins stopped at AA Motel on 9th St. n. of US 30.
 Had supper + breakfast at Adams Restaurant; very nice
 but also very popular + therefore not quick.

July 9. Post Office open at 9 a.m. Letters from Ruth, Sat. SB, and Noreen.

Station 83. ¹⁰8 mi. east of Rte. 130 ^{s. of} Saratoga. El. 7900 ft. Three lupines, A, B, C. C has very broad leaf, had eggs on 3/6 stalks (Downey thinks B narrow is same as C). 0/25 TBB on B, JCD found eggs on B. ^{2/33} 2 *icarioides* ♂, ^{A+} *heteronea*, *T. hypophloeus*, ^{+editha} *melissa*. *Colias alexandra*, ♂ *Crambo*, bee fly, etc.

Station 84. 2 mi. above sta. 83. A damp roadway. ^{8050 ft.} 3 more *Colias*, 2 *Cicindela*, *lygdamus*, *comyntas*, *sapiolus*, many flies, beetles, *Stratiomyids*, *Chrysids*, *Coenellids*, *Meloids*. [+ *Raphidiidae*, *Cicada*, *acmon*, *Cenomyzma* ^{Satyridae}].

Station 85. 4 mi. above sta. 83. Along road in pines. Elev. 8400 ft. Lupines look similar to C of sta. 83. Horseflies, deer flies, Asilids, *Cherids*, *Cerambycids*, etc., etc. *Sapiolus*, *comyntas*, *icarioides* 1 ♀ ^{kept} alive *lygdamus*, *Mitoura* sp.?

In this 500 ft. range of elevation, from open sage brush flat up into dense pine woods, the lupines seem to be the same - the ~~leaf~~ broad leaved sp. C. *icarioides* occurs in the pine area but very sparsely. We'll try the sage flat again, where all the "indicators" are present: *Balsamorhiza* (mule ears), *Castilleja*, *Eriogonum*, sage, *Penstemon*.

Station 86. 7 mi. e. of Rte 130 s. of Saratoga. Elev. 7600 ft. 5 or 1 ♀ alive. 3 eggs/12 stalks. *Editha*, *sapiolus*.

Station 87. 9 mi. w. of Riverside and Encampment. Sierra Madre Mts. 8700 ft. *Salix*. *fuliginosum* 1 small *icarioides* ♂, *heteronea*, 3 *Cicadas*, ant lion, 1 *Cerambycid*, 8-10 green *Typha*, *Elaterid*. *Basilarchia wiedemeyeri*

Station 88. ^{above Battle Lake} Top of pass s.e. of Bridger Peak, elev. 9916 ft. Lupine rank in large fields exposed on west slope. Stiff breeze and low temperature at about 5 o'clock. ^(2nd) Pass above Battle Lake. Blues were not flying at first but could be clearly seen resting on the lupine flowers. They could be picked off by hand, or observed so closely as to be positively identified. This pass is 15 mi. from Encampment and 26 mi. from Slater, Colo., which is also 15 mi. from Baggs and Wyo. Rte. 289 (Colo. Rte. 13).

to p. 57 Station 89. Edge of Medicine Bow National Forest, 10 mi. e. of Savery, Wyo. S.W. corner of Sierra Madre Mts. Elev. 7500 ft. Lupine + sage flats, lupine variable. No blues. 12+ eggs. 5/22 stalks on a hairy variety. Found a dead *Pieris protodice*. 1 cluster of *Vigena* parasites. Inst., *icarioides*, *lygdamus*, *P. sapiolus*, *P. melissa*, *Agrotis glandon*. *Colias*, *Hecla*, *Oeneis*, *Speyeria*, *Parnassius clodius* + *smintheus*. No misc. insects except 3 sawflies.

See also Sta. 91, p. 58.

The Sierra Madres brought back few memories from my 1925 visit (35 years ago). The pass is at least a mile from Bridger Peak, with no sign of a road or even trail over to it. Couldn't see whether there was a fire lookout on top. Didn't see the old aerial tramway that ran southward across a rocky valley. The mountains can't be seen much from the northeast, but they must be more prominent from the south. They give a grand view of the mountains in northern Colorado, exaggerating their size.

Just over the pass, facing a little south of west, a steep slope leads several thousand feet into a beautiful green valley, park, with a lake, several small moraines, large meadows, and some roads. The only road that could have led to it was unmarked but was only five miles or so below the pass. This is one of the most attractive spots we've seen on the whole trip.

July 10. ^{Sun.} Drove up to the Pass again, it drizzled just as we reached it, then the sun came out slowly. Took about 20 icarioides, before the wind rose about 1 p.m. Same as sta. 88.

The lupine collected on the pass yesterday and marked "non-host" is the host for Glaucopsyche, which ICD watched ovipositing on the buds. Today took samples of the non-blooming variety of lupine, which is in large beds separate from the fields of blooming ones and also scattered among them.

I walked around a small hill at the pass and found the road that goes up Bridger Peak, 4 miles. It also goes to some ranch 14 miles. Other branches go to Battle Ametery, etc. Looks navigable.

On the way down (west again) we turned off three miles below the pass on the "road" that goes down into the valley. It was a mistake with this car, although apparently quite a few cars do go down. We barely made it back out. A pickup truck with standard transmission would have little trouble.

Station 89. Put by mistake on p. 55. e. of Lavery, Wyo.

Station 90. 4 mi. e. of Baggs, Wyo. on road to Dixon. Lupine along road cut, in sagebrush. 1 egg + 1 hatched. 1 1st instar larvae. 1 Eleodes, 1 Carabid. Lupine sample.

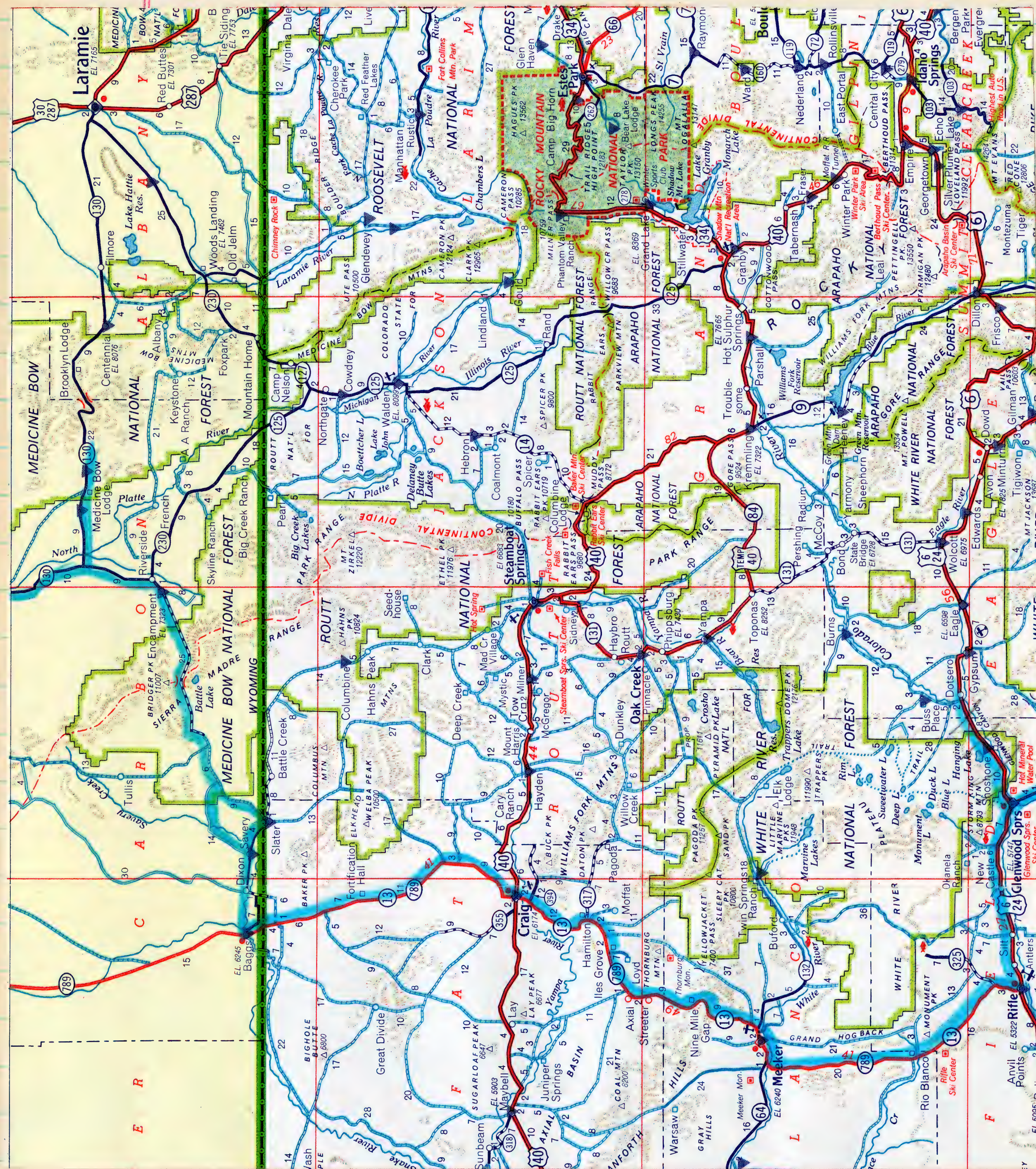
In Rifle, we stopped at the Kozz Cottage Court, and got a nice large cabin with two double beds for \$6.00.

Station 91. Battle Lake, Wyo. Sierra Madre Mts.
down in valley below the pass. (Belongs on p. 55)

We came through very interesting country today south of Craig, Colo. Mostly down narrow valleys between upended strata striking north-south. Everything covered with green vegetation, the hills with scrubby cedar and an occasional small patch of pines. The valleys mostly cultivated and obviously well-watered. Several of the hills to the southwest had very even and straight ridges sloping down to the north. Looked like rift valleys but were probably erosion behind hogbacks. Took one photo just as the sunset, showing the ridges trimmed with sunlight and the rest dark.

Lupine occurred occasionally in isolated clumps over much of this route. It had rained in the mid-afternoon, so there was no use stopping for blues or even eggs.

John phoned Warren and got a report from Woodie: 1350 eggs received, 155 living larvae (hatched), 356 hatched on route, 300 parasites emerged (115 from Harrison Pass), 70 lupines planted.



July 11. Stopped at Canonvale, Colo., to see the Crystal River
 Mon. Rearing Unit (fish hatchery). It consists of 10 parallel
^{raceways} (flumes) 800 feet long, six feet wide, 18 inches deep, and
 divided into 8 100-foot sections. No connection
 between the channels. Water from springs not reused.
 Fingerlings 3 or 4 inches long come from Rifle Hatchery
 and spend about a year and reach 8 to 10 inches,
 averaging 4 or 5 to a pound. Four species present
 but plant mostly rainbow, ^{each taken} native spawners,
 brook, albino brook. 4 men & supervisor.

Water temperature about 52° year round. Open
 through winter by pumping from Crystal River.
 Planted 35 tons in 1959, 28-30 tons this year.
 Feed beef spleen, smaller ones beef liver once
 a week, other days prepared pellets.

Sorting box with screen on bottom to sort
^{24x24} them by hand over the walls into adjacent
^{raceways} flumes. If too heavy in one use seine to
 transfer. Spawners from here is all taken to
 Glenwood Springs hatching unit.

Rifle Hatchery, 16 men, 100+ tons of fish planted.
 Four flumes as large as this one. Set-up much
 the same as here. Photos taken.

"Better put it ^{off} till tomorrow, we've saved up enough today."

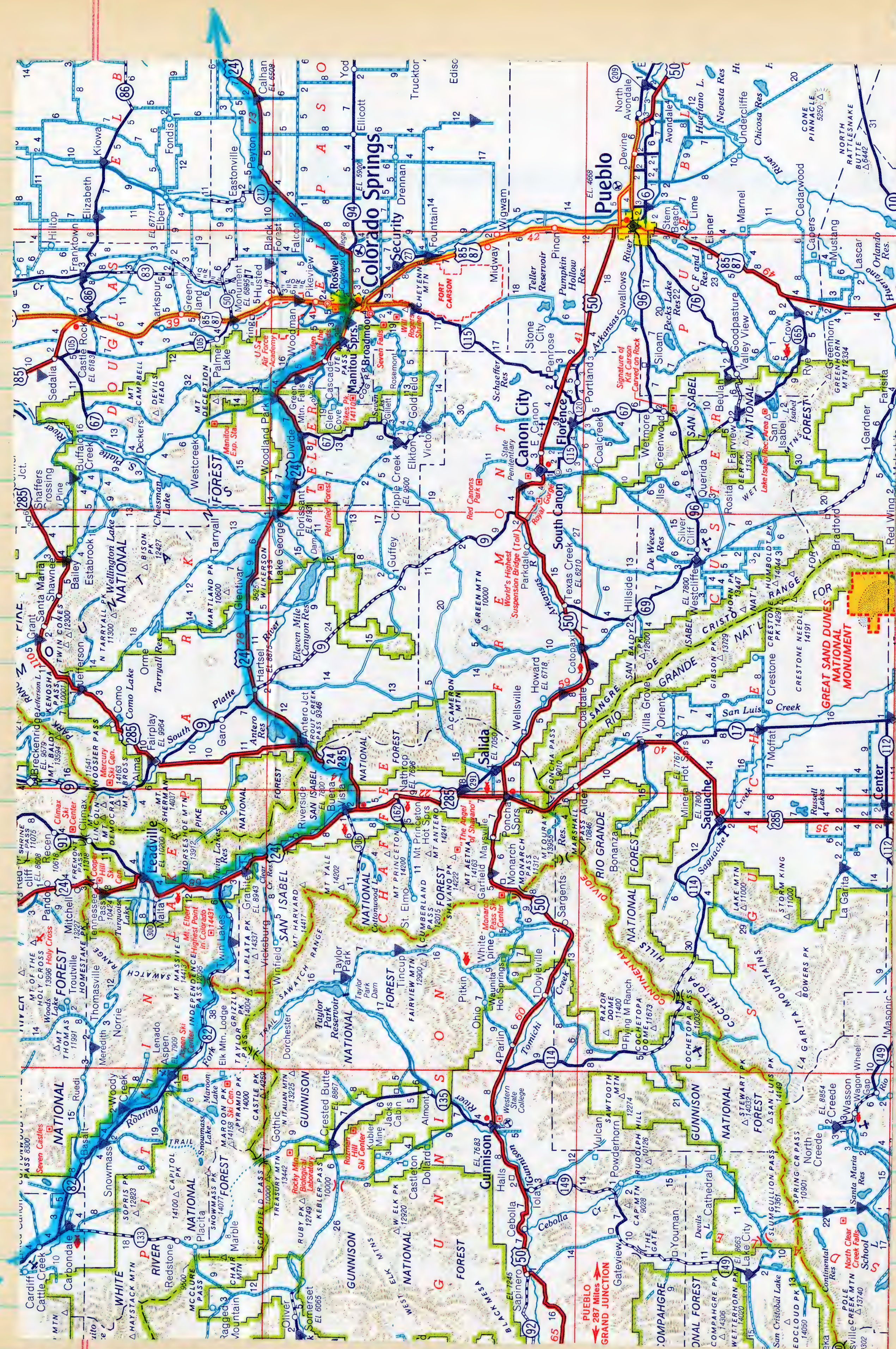
Station 92. 2 mi. n.w. of Aspen, Colo. Elev. 7625 feet.
 2 p.m. bright sun. Lupines sparse in heavy sage. Eggs
 and adult *icarioides* 6♀ + 10♂, *Lygdamus*, *T. helaranea*,
T. helloides. (2 alive) *Pieris protodice*, *Glauconympha*,
Satyrus, *Zonitis sayi*, Mordellids, Vespids, Megachilid,
 yellow & black Crambycid, 1 small Staphylinid fly ing.
 Lupine collected, also seeds.

The Aspen ski slopes are visible from here. One
 entire mountain slope has been cleared and stands
 stark in the summer.

Saw no lupine up the pass (to 12095 feet)
 or down to Twin Lakes Lodge, although the
 spruce replaced the aspen. Scenery was fine,
 much glaciation, rocky peaks above timberline,
 roaring streams. At the lodge we stopped for
 coffee and asked the waitress if there was
 any of the blue flower called lupine around.
 She said there had been and we looked out
 the window behind the car and saw a
 dozen masses of it. None down the road
 for two miles. Only scattered small patches
 of it on the Leadville road.

All motels in Leadville were either full or
 had doubled their rates, so we went to the
 Vendome Hotel. Had little to mount, so we post-
 poned it and went to a movie.

So much topography has flashed before us and been replaced by more the next minute that it's been impossible even to note most of it. Today several large snow slides where trees were down and piles of snow still survived because of the great mixture of mud, leaves, and rubble. Yesterday a long sloping ridge near Rio Blanco, which exactly paralleled the edge of the plateau, - looked like a rift valley but probably was more of a hog back. The photo should show several parallel ridges in the background. Glaciated valleys with hanging side valleys and moraines, especially in Battle Lake Valley in the Sierra Madres. Valleys cut off by a lateral moraine, which was later channeled by the side stream ~~of~~ out of line with its original position. Meads, buttes, hog backs, cliffs, formed by harder beds on top or tilted. The irregular erosion of soft material, often greenish or red, by water or solution on steep slopes. The badlands in southwest of the Big Horns and the red hogbacks southeast of them. Landslides of some years ago, where the scar was too steep for vegetation, which completely covers the irregular mound below.



Valleys formed along the strike of upended beds. Valleys or canyons cutting across the strike of upended beds, as the Wind River canyon between Shoshoni and Thermopolis, Wyo. Valleys between fault-block ranges, as Ruby Valley, Nev.

Mountains that were elevated fault blocks, like the Rubies. Hills that were old lava flows left high by erosion, ~~than~~ as in southern Idaho. Mountains of basalt left by erosion of the surrounding beds, as north of Casper, Wyo. Mountains formed by the broken and upended beds where the intrusion has collapsed or at least disappeared, as

^{somewhere in central Wyoming.} Mountains that have hogbacks only on one side or on both.

Tremendous talus slopes, and the small areas of less than an acre where the angular blocks average 18" on a side, such as passed on the road below Bridger Peak in the Sierra Madres and on the road above Aspen, Colorado. Steep smooth slopes formed ~~by~~ along a bedding plane, as just south of Muddy Gap between the Ferris and the Green Mountains.

Wind erosion very difficult to distinguish from solution erosion. The bad lands may have some of this, although the source of sand was not evident.

Desert pavement was noted in the areas of badlands southeast of Ten Sleep, Wyoming. As we were generally looking for sagebrush country, we seldom stopped where the desert pavement would be seen. Sand dunes were not seen on a large scale.

A long valley through tan and greenish apparently unconsolidated materials was that of the Salmon River north of the Sawtooth Valley in Idaho. Surface lava flows such as in southern Idaho between Mountain Home and Ketchum.

A rounded enfoliated "granitic" dome a quarter mile across and almost hemispherical called Independence Rock east of Casper. Many other sorts of outliers and erosion remnants. Teapot Rock near Teapot Dome, as a carved remnant. Jagged ridges apparently caused by cirques on both sides, as in the Sawtooth Mts., or by other erosion.

Narrow box canyons were seen in the southeastern Big Horns, above the red hogbacks. These were very steep. More normal ones occur in the lava bed country of Idaho. Rocky canyons (cliffs), talus canyons, flat-bottomed canyons.

July 12. Station 93, 2 mi. east of Leadville, Colo. (7th Street)
 Tues. In cloudy weather, found a few eggs on leaves and quite a few on buds. Also stems, flowers. Sun came out about 9:30 a.m. and immediately blues were flying. In less than an hour took at least 20 icarioides including live females, melissa lygdarnus, glendon, sapiolas. Parnassius sminthius, Boloria, Erebia, Oeneis. About ten o'clock the clouds covered over again, and we called it enough. The lupine variable. One purple all over. Some white. Elevation 10400 ft.

John broke the frame of his net, so we'll have to find a machine shop. (The third frame we have just isn't usable because the stiff net can't be removed.) The break was caused by the necessity of slamming the net down over specimens, as they had a way of escaping otherwise.

With mail for both of us came a telegram from Woody that he was running out of lupine to feed the newly hatched larvae. John agreed to airmail some, but on figuring times, it seemed likely that no parcel could be delivered before Thursday, and we could be home by Thursday ourselves without cutting the trip short particularly.

Some picked up 15 1-gallon jars from the hotel kitchen, coupled up four plastic bags and an ice chest, and figured we could get some lupine through in as good condition as the airmail.

Left Leadville at 11 a.m. to go out through Colorado Springs. After we went over the first pass, began to watch for lupine, although it was raining most of the time. Found one spot in the tenth Plateau Valley and filled five jars. From then on saw none at all. By ten miles up the canyon from Colorado Springs we were worried that we wouldn't find any more at all. Then in a road cut one bunch appeared, and it turned out to be a dozen bunches there and more along an old road. Filled the ice chest and two more jars. From then on saw none. Got 10 lbs. of cracked ice at Manitou.

Decided to follow US 24 to US 70.

We phoned F. Martin Brown from Manitou, but were told that he is in Durango and won't be back for a week.

At Limon I let John drive, as a special favor, with his driving that is responsible for the wobbly writing.

"Variation and evolution in *Plebejus icaroides*." This is the title of John's project and NSF grant. This species was described in 1852 by Boisduval, from one specimen from California. Since then 24 names have been applied to this species or to portions of it. Early work by Barnes & McDunnough and by Hovavitz have straightened out some of the synonymy and are the basis for the 13 subspecies commonly retained. John's original interest (Master's thesis at Utah) was an attempt to verify the validity of the subspecies and to determine the characters of taxonomic importance. It included all available material - not very much. Distribution in western N. A.: sea coast to 10,000+ feet in Calif, Utah, Colorado, north to Shagway and Lake Louise, south to Orizaba in Mexico. Mostly in Canadian and transition zones. The morphological approach was further extended and used for Ph.D. thesis at larva. The genetic approach was limited ~~there~~ by lack of knowledge of breeding, habits, etc. The basic approach was a statistical comparison of structures, both in and between populations. Parameters of structural variation were plotted for over 100 different populations, throughout the range of the species.

Both museum and field-collected material was included. As a result of this analysis of the 100 populations, he had some idea of the range of variation of each of the characters studied - some 25 or so, and which were genetically and which environmentally influenced. Information on life history and rearing techniques became adequate to check these results, in laboratory, which is the current problem.

The present study is to include comparisons of populations from many parts of the range all taken the same year (first year) and comparison of newly collected populations from the sides of the original 100 populations. Also to study compare populations by rearing in the laboratory under identical conditions the eggs collected in the field. Other data obtained includes host specificity, parasitism, onset and termination of larval diapause, ant associations.

Plebejus is one of 750 generic names in the Lycaenidae. Many others show the same range of variation. Some 3 score of these belong in subfamily Plebejinae. About 100 Holarctic *Plebejinae* (sp. + subsp.).

All the "blues" are Tychenidae, but not all the Tychenidae are blue in color. With the collaboration of Ehrlich and Clench, John is working on a generic monograph of the Tychenidae.

This year the problem of marking specimens in the field failed to work out, but several new areas were collected.

Ketchikan.	12131
Nas	12143
Sta. 49.	12134
Sta. 50 Nakona	el. 8500 ft. 12174
Lunch	12192
Enallia Sta.	12300 approx.
Station 53	12399 approx
Summit.	413
Lead Horse Road & 93 -	455.0
Sta 56	461.7
Stat. 57 - - -	63.9
	12300
	12131
	169

Merrisula	12546	Sum.
Zolo	558	
Top of pass	592	
1 mi down Zolo	626	12872
Gas	12636	12546
Bearmouth (62)	12678	540
Bozeman	12865	
Bozeman -	12872	
Sta. 63.	12892	5,000'
W. Yellowstone	12870	
Sta. 66.	968.8	
end	12971	
	12546	
	12300	
	246	

Elev. 7550 ft.

Station 94. 5 mi. w. of Ute Pass, Colo. in the South Platte Valley. An banks still soaking from snow. Collected lupines in the rain for use in rearing in Carbondale. Eggs were seen.

Station 95. 2 mi. w. of Cascade, Colo., just west of Colorado Springs. Lupines collected for rearing. Eggs? seen.

Station 96. 25 mi. east of Colorado Springs, Colo. on highway US 24. Lupines collected for rearing. Eggs not seen.

VII-13-60 Station 97. Ellsworth, Kansas. 1 smooth black *Calosoma* (?) on sidewalk.

W. Zolo.	12972
Turn off	12776
Sta. 67	12993
Wyett. Gas	13020
Sta. Sr. Entr.	13091
Sta. 69.	13093
Coulter Bay	13113
Sta. 70	128
Ass Stop - Lodge -	13136
Togwotee Pass	172
Sta. 71	175
Du Bois - North -	030
Sawmill	12.
Du Bois South	227

Lander	13308
Collecting site	13320
Lander - east	13331
Riverton - gas	357
Sta. 74	429
Ten Sleep City -	483
down Ten Sleep	500.0
new road	506
76 (7725)	507
Pass	521
meat lupini -	535
Buffalo	560
	13565
	308
	257

Buff. Sta 79 13567
 587
 Buff-south 611
 Mayoworth Road 642.0
 Top road above Mayoworth 659.6
 6850' 61.6
 22 switchbacks in 2 mi.

13887

567
 320

Rawlins - east → 13 890

Eugene Elev.
 5200' to

Pictures Ferris Mt. near
 Whiskey Gap (East of Here)

Saratoga turnoff 13 ~~913~~
 Saratoga 935 ~~945~~
 Sta. turn 955

Med. Bows, highest — 959.5

130/230 13975

Sta. Riverside 13985

Sta 87 - 8700' 994

Top of pass 14001.2

Baggo 14050

Sta. 90 142

Baggo Sta. → 48

Leadville 14437
 Sta 93 14441
 Leadville out 14445
 Colo Spr. 3pm 14575
 Limon 658

14898

460

Wakeeney, Kansas 14900.0
 7-8 45 950
 8-9 45 15025
 9-10 35 15000
 10-11 55 15155
 11-12 75
 12-1 8 (start 11:15) 63
 1-2 42 05
 2-3 45 15250
 3-4 55
 4-5 45 350

Rifle 14288

Snowmass 14354

Sta. 92 365

Pass 14390

Twin Lakes 14412

Intersection —

So. of Leadville — 425

Aug. 27. Carbondale to St. Louis. Picked up 1960 Chevy (Purguise)
 Sat. from Herdy. Met EB at Congress Hotel, drove over to
 Paul Blackwelder's for a few minutes, then out on
 US 40 intending to go a few miles. About 4 p.m.

Finally stopped in Higginsville, Mo. on rte. 13. 226 mi.

Aug. 28 Ranges 13-24-71 to St. Joseph. Then 36 to Oberlin, Kans.
 Sun. Rte. 83 to North Platte and US 30 to Ogallala, Neb.

For the last 30 miles into North Platte we passed
 through country of grass-covered hillsides, too big
 for simple mounds; proved to be old sand dunes,
 Late Pleistocene, which cover large areas of n. Nebraska.
 Took two photos (one I interfered with the shutter).
 The sun was very low and threw good shadows.

Some nice shallow erosion areas just south
 of this, showing two stages of erosion. (No photo) 596 mi.

Aug. 29 US 26 Ogallala to Casper, Wyo., then US 87 to Buffalo,
 Mon. with side trip to Mayoworth & beyond. (Mt View Motel again) 465 mi.

Followed the North Platte River all morning but
 without seeing much of it. Saw bluffs in the distance,
 and crossed them near Scottsbluff. Rolling
 prairies to Casper, with one large oil field. Many
 of the ridges to south formed by tilted beds. Passed
 Teapot Rock and other erosion remnants. Photos.
 As we neared Kaycee, had good view of the hogbacks
 along southern section of the Big Horns. Turned
 off at Kaycee to Mayoworth and on dirt road
 through the hogbacks, same as July 8. Photos.

Aug. 30 From Buffalo via US 16 over southern end of Big Horn to
Tues. Ten Sleep and Worland, ⁴⁵²⁰ to Greybull, Lody, & West Yellowstone

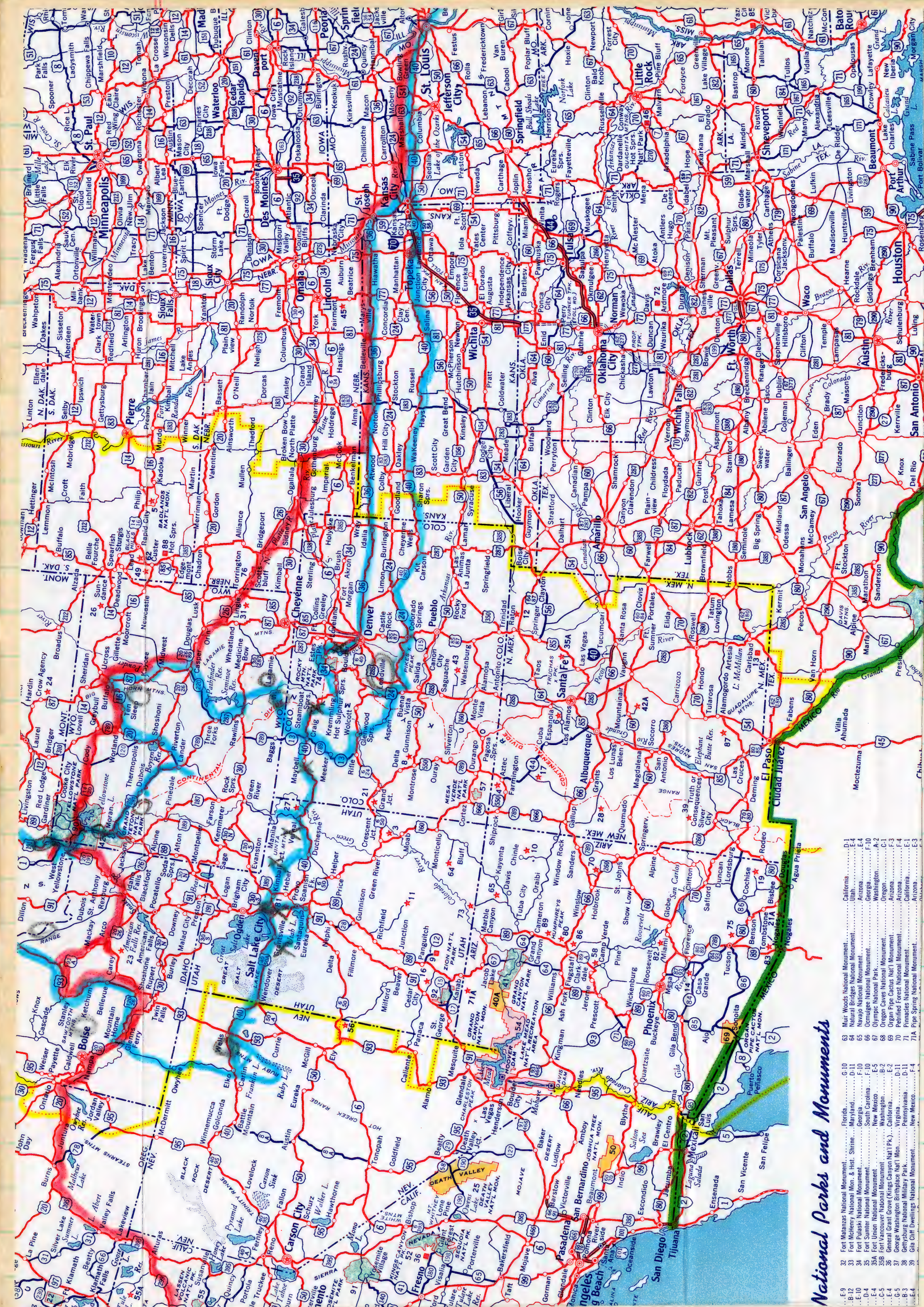
The main range is visible only as you start up the road, as one soon turns south through park areas where there are no views. This is mostly stream and mudflow gravels, few outcrops. Only at the top of the pass, 9666 ft. do the pre-Cambrian gneisses crop out in large jointed masses. The gravels were probably derived from glacial gravel above. In the Ten Sleep Canyon, there are high cliffs of massive Mississippian limestone (dolomite), chert, sandstone, shale, intermined. The only glaciation was in the upper Ten Sleep valley, running south, with the end probably where the canyon starts - to west.

Just west of Ten Sleep, across the red valley from the mouth of the canyon, a bright red cliff with nearly horizontal beds, Triassic Chugwater, gives way very suddenly (horizontally) to the variegated gray-green Morrison (upper Jurassic). Must be a sharp fault or overturn, followed by a sharp valley. This is just to the left of right of the road. Morrison on left. Farther to the left there is a resistant bed showing occasionally in the cliffs, forming ledges with triangular caves beneath. Photo of these ledges.

The Morrison gives way to Cretaceous and then to Eocene. All gently dipping west, all fine-grained shales. No gravel or desert pavement. Evidently very dry but enough plants to keep wind erosion down. Oil wells scattered all over this area, some new, some pumping.

In the afternoon we turned west toward Lody, climbed out of the river bottom onto the whitish or variegated Cretaceous or Eocene shales. This continued with some bluffs for 100 miles. At Lody we saw Heart Mountain 10 mi. to north. It stands alone, almost a bubble on top, an erosion remnant, but actually of complicated structure - the Heart Mountain Overthrust. The Paleozoic ^(?) rocks on top of the Cretaceous/Tertiary, moved laterally several miles (eastward) and then eroded.

Just west of Cody we entered the Shoshone Canyon. It passes through many miles of mountains forming a large area rather than a single range (Absarokas). The canyon is lined with cliffs and talus slopes, mostly in Eocene volcanic breccia. Many elaborate pinnacles, with recognizable shapes. Occasionally a 6-foot dike crosses at right angles to the road, making a sharp outcrop up the sides of the canyon. These pyroclastics range from fine ash to large fragments of rock, worked after the explosion emission by mud-flows, etc. into alluvial fans. These sometimes show stratification, and sometimes folding, but very prominent vertical jointing. The joint blocks are caused by shrinking especially with twisting. Numerous side canyons seem to show similar conditions over a wide area. EB was interested in seeing evidence of glaciation inside Yellowstone Park. We saw not one single definite piece of evidence. There was supposed to have a glacial cap over the whole plateau, perhaps built up from neighboring ranges. If so, EB thinks it must have been old - probably second epoch (the earliest one recognized in the Rockies).



The fourth epoch (Wisconsin) would be seen in unmodified moraines, usually very evident. The third epoch might appear in moraines or in road cuts, but only "possible" examples of this were seen.

We stopped briefly in the geyser basins.

Aug. 31 Wed. To Hebgen Reservoir + Montana-Yellowstone Earthquake Area. Saw what is visible from the north end, including the fault scarps, the Hebgen dam damage, the road breaks, the new lake covering the road but 50 feet lower than the original level (because of a cut in the landslide made by the Forest Service). The topo sheets I brought along were not very illuminating. We decided not to go around to see the landslide from the southwest.

My cousin Justin Hill was camping in the area at the time of the earthquake. They were so located that they got out without assistance or difficulty.

Back to West Yellowstone and out to Idaho Falls by US 20. Same route west to Arco and then southwest to Craters of the Moon National Monument. This is a well arranged exhibit of 75 square miles of lava flows, cinder cones, craters, splatter cones, cinder, etc. Exceedingly rugged, but with good roads and trails. A fantastic place. Photos.

Just north of the Monument is an east-west line of hills/mountains with a young pattern of valleys but few gulleys. The entire surface, not very abrupt anyway, was singularly smoothed. It girded that sand from the plane had blown onto these hillsides and literally buried the gulleys. I took two photos.

Also on the edge of the Monument I took photos of a small pressure ridge on top of the sheet lava, which split open radially upon cooling. Also a view of the very cliffy mountain face northwest of Arco, ~~was~~ formed by alternating hard and soft beds of limestone^(?) (Paleozoic?).

Coming west from Idaho Falls we passed Twin Buttes, one obviously a volcanic cone, the other presumably also one but not looking like it. Also a much larger mass called Big Butte, which also shows evidence of one or several craters.

Rte. 20 from W. Yellowstone to Idaho Falls, to Arco, and the Craters of the Moon. Then back to Arco.

Sep. 1. From Arco north on ^{ste 93^{ALT}} to Challis, then southwest
Thurs. on 93, along the Salmon River to Sawtooth Valley
& Shoshone, then ^{ste. 20} to Boise and on to Caldwell, Ida.

Northeast of Arco along the Lost River range, which is rugged, with ~~to~~ high outcrops of nearly vertically tilted beds - probably early Paleozoic. Along the face there were triangular facets at the end of ridges between gulleys, apparently along a fault line. Farther south the outcrops were ~~only~~ mostly high up on the mountains and the lower slopes were smooth slopes and rounded surfaces, very steep for alluvium and probably creeping. In many places an "eyebrow" line across the base of the range seemed also to show a fault line.

These foothills and come out in the valley farther north are devoid of any but very small and inconspicuous vegetation. They are somewhat irregular in arrangement and smooth all over. One large pair of alluvial fans showed overlapping due to higher level of one. This ~~one~~ seemed to head up into a cirque, possibly with a terminal moraine high up, right at the outlet of the cirque. There seem to be old cirques on many of the peaks, but not very definite ones.

The Salmon River Canyon above Challis is similar to the lower part, very evenly V-shaped but winding - the curves evidently determined by features older than the river. Most slopes are talus, sometimes with low vegetation. Often there were narrow channels called rubble stripes that seem to be shallow gulleys later ~~than~~ filled with the rubble. Sometimes little mud flows have come down on top of the rubble.

In the Sawtooth Valley we saw the long moraines on the west side and apparently at least one from the east. One of the west apparently crossed the valley and may have dammed it temporarily.

Sep. 2. From Caldwell, Ida. on ^{ste. 20} to Burns and then
Fri. south to Alturas on US 395.

Following the Malheur River, after a few miles of monotonous country, began to see many of what EP calls "rubble stripes," narrow and shallow lines of angular talus that ^{only} fill a small gully, probably made in a single storm. They are frequently all over a hillside but always follow the straight line ~~line~~ caused by gravity. They are usually on steep slopes but sometimes on gentle slopes. ^{Photo.} There must be a source of the angular rubble, usually a lava outcrop.

A few miles north of Lakeview we came on a small playa ^{Baldcarro Lake} (photo) and then noticed that the valley had very clear lake benches all around, probably nearly 200 feet high. At the south end these certainly topped the ridge around the end, and there was another playa in that valley.

The south end of this second valley also seemed to be low enough to overflow but we found no evidence that it had. Right on this divide there was a fine example of a fault block slipping off the cliff onto the valley floor. The cliff is 2500 feet high, very abrupt, and we later on saw many slips. On this one the top surface was preserved although broken into several blocks. Photo.

All day we were in old (Miocene) lava country, occasionally seeing soft light colored beds of volcanic ash.

We thought we saw water flowing out of Goose Lake on the California/Oregon border, but it is supposed to be landlocked since 1869^(?). The stream certainly flowed away to the south - may have been ^{spring} ~~stream~~ - fed.

June 24. Mileage 53919. Left Cardandale with John Lawney at
Sun. 9:30 a.m. in a University Mercury (3-104, Ill. lic. U-4296)
bound for western Nebraska & South Dakota (+ perhaps
farther west and south) to visit the easternmost
localities of Plebejus icarioides. Took rte. 40 from
St. Louis, 71 from Kansas City, and 36 from St. Joseph.
Stopped first night at Belleville, Kansas. ⁵⁸⁹~~400~~ mi.

There were so many insects around the motel
lights (Bel Vista Motel) that we couldn't resist them.
Took enough to fill a Schmidt box. No cerambycids.

Last night about dusk we kept thinking we saw
lupines along the road. Probably only alfalfa or clover.

June 25. Mileage 54508. Turned north on US 81 to York, Nebraska.

Mon. Sta. 102. 10:15 a.m. 5 mi. n. of Belleville, Kans. 2150' elev.
Collected on roadside in large thistle patch (much of
thistle past flowering stage. Just prior to rainstorm.
Not many things flying. Taps fly short distance & then
settle down. Collected: 1 ♀ Eucosia comyntes, Selyridae
(common, several species), Phyciodes, milk-weed ceram-
bycids (Tetraopes), weevils in copula, several large
green chrysomelids. Noted absence of Epicaurata & Nemog-
natha on thistle.

Another heavy rainstorm during lunch in York.
From there to Grand Isle, much thin smoke from rear;
proved to be transmission fluid.

There had been storm warnings over this part of
Kansas and Nebraska yesterday and today. (Tornadoes)

at Halsey (54775) there is a section of Nebraska Nat.
Forest (Berkey Div.), a pine-covered ridge among the
sand hills. Also a nursery.

Stopped for the night at Alliance, McCarroll's Motel.
Very roomy and quiet. Met a party of seven USDA men from U. of
Nebraska on a soil erosion project. One elderly man named
Weakly had studied lupines in this area as possible cattle
poisons, so he knew a lot about their distribution up
into the Black Hills. Gave us many pointers. (The poison
was selenium from the soil - lupine not particularly
bad as an accumulator.)

June 26. Mileage 54919. Time change. Left town about 7:45 a.m.
Tues. Sta. 103. Highway near Hemmingford (Neb. rte. 2). 1 large
red-striped Sleodes.

No callot at Hill Top Motel in Crawford.

West thru Moline Canyon on US 20. No lupine
until on barren hilltop about halfway to Harrison.

Sta. 104. 13 mi. e. of Harrison, Neb. on U.S. 20. Small
lupines along road with eggs & 1 1st instar larva. No
adults flying. Ants tending aphids. Took lupine
samples, also another plant with same habitus but only
3 to 5 very broad leaflets. Windy; humidity 60; temp. 24°.
elevation 4900'. [Few minutes later, same place, several adults.]

Drove north from Harrison into "canyon country,"
pine-filled valleys, not very steep, opening out at
both ends in eroded badlands or sandy hills.

Weakly

Sta. 105. Monroe Canyon, 6 mi. n. of Harrison, Neb. 4900' ±.
Lupine but only Phacodes pascuus; skippers, Speryeria,
red clerids, a bruchid; buprestids, flies, etc. Windy.

Sta. 106. Sawbelly Canyon, 5-10 mi. ne. of Harrison, Neb.
Good deal of lupine but until the last moment no blues.
Hot lupine samples. Bumblebees, gray + blue damselflies.
Elev. 4875'. Humidity 77. Temperature 26.5°.

1. Hydrophilid, flies (small muscoids), ichneumonid, pompilid.

Sta. 107.

Many large cythrini or calosomas running on road.
Also about 4 Nemognatha on unflowered.

Stopped in Hot Springs, S.D. for the night.

Sta. 108. Hot Springs, S.D. A small solpugid
running rapidly on floor of motel room.

June 27. Mileage 55109. Car not running very well and
Wed. exhaust noisy, so we pulled into a Mercury
garage. Exhaust gasket + automatic choke.

Drove to Custer. Stopped at Forest Service Office,
and were told of a limestone area to n.w. No lupines
evident in the surrounding granite areas. 3 mi. n.
of town turned west on road to Moon. Mileage 55147.

Sta. 109. 14 mi. n.w. of Custer, N.D., on road to Moon. Large
buprestids, small cerambycid, small buprestids, 4 species
of lycanids, etc. Pieris heguacardi. [added to Sta. 110.]

Sta. 110. 20 mi. n.w. of Custer, N.D., on road to Moon. Lupines
+ several lycanids, but no icarioides. Temp. 22.5° C.,
humidity 60. Mileage 55167. Pieris + Parnassius. ^{conies}

The blues included: Calliphrys eryphon, Glaucopsyche lygdamus,
Eversmannia, Plebejus saepiolus, + Agriades glandon.

A ^{half} mile farther on found a larger hairier lupine.
Elevation 7000. Two species growing + flowering side by
side. Hirsute one has larger blooms taking longer to
mature but seem to start blooming later.

Add Colias? ^{alexandria}, Phyciodes, 4 Glaucopsyche. 1 live ♀
Agriades glandon.

Sta. 111. About 4 mi. n. of Moon, S.D. A large bank of
large hairier lupines. 1 ♀ 1 ♂ P. icarioides, many
green Lytha. Counted 100 stalks - 1 egg!

Went through mining town of Lead, jammed be-
tween walls of canyon - large open cut mine -
no lupines - to John's Motel in Deadwood, S.D.

Very few insects flying at night, altho warm.

Sta. 112. Deadwood, S.D. At lights, 1 Cerambycid,

June 28. Sta. 113. 5 mi. w. of Lead, S.D., a few glabrous lupines.
Thurs. Several blues + other butterflies.

Mileage 55225.

Sta. 114. Spearfish Canyon, 2 mi. n. of Sargoy, S.D. Elev.
4800. Glabrous lupine in seed. Massive limestone.
Chafers, 1 new blue (Pseudargiolus), gray ceram-
bycids, coenocellids, small buprestid, misc. butterflies.

Deadwood + Lead were in slate or colored
rocks, not limestone. Latter appeared about
5-10 miles to west of Lead.

At Sta. 114 John saw a swallowtail that seemed to be a hybrid between Papilio eurymedon and P. rutulus. P.e. has whitish wings. P.r. has three tails. This specimen had white forewings only, and three tails. Specimen got away.

From Spearfish, S.D. took U.S. 14 to Sundance, Wyo. Alfalfa lush all the way. Also in the red beds all the way.

(on road to radar tower)
Sta. 115. 5 mi. n. of Sundance, Wyo. 6250 ft. Pine forest. Many lupines in isolated patches. Glaucopsyche lygdamus and other butterflies, gray cerambycids, sphingid that mimics bumblebee. Also in Reuter Canyon 350' lower shadow. Many lygdamus, 1 icarioides.

Sta. 116. Hills about 1 mi. n. of Sundance, Wyo. 5075' elev. Dense lupines on exposed hillside. A few icarioides, many Lytha, 3 Rhynchites, canadensis, 3 cicadas.

Kept west + north to Devil's Tower. Then north + east back into South Dakota. The tower is very impressive.

Sta. 117. 5 mi. e. of Hulett, Wyo. Along road in red beds. Very large lupine. No blues. A reduviid, several striped cerambycids, a chafer, an elater, a hesperiid (black), 1 Pieris bequaerti. Elev. 3950'.

1/4 mi. farther east, at least 15 icarioides and 1 egg.
1 Euclyptus, 2 Asilids, 5 ♀ (2 alive) 1007
1 black + red cerambycid. Temp. 27.5° Humidity 58%

Arrived at Belle Fourche about supper time, but found both ~~the~~ motels full. Found another.

Sta. 118. Belle Fourche, So. Dak. Flying to lights. 3 ♂ Prionus, 2 Phyllophaga, 1 Coprinae, 4 spp. Carabidae, a water boatman, 1 reduviid, 1 carpenter ant, 1 Zion.

Up to 2 nights earlier, the motel had had its furnaces on at night. Earlier in the day a bartender reported that this had been the coldest and wettest spring at Hulett, Wyo., during his lifetime. 22 inches rain since April. Aver. ann. precip. is about 12 inches.

June 29 Headed north on U.S. 85. Mileage 55396.

Fri. Sta. 119. North Cave Hills, west of Ludlow, S.D. 2850' elev. Temp. 37.5° C. Humidity 38.5%. Many lupines starting halfway up valley, heading north. Many P. icarioides, ants in association with living larvae, eggs. At least 2 spp. of ants. A living ♀ icarioides, 1 cicada, 1 ant-like bug, 3 bumblebees, 1 green Lytha.

This was about 2 mi. s. of Valley Pass. ^{3050'} The surrounding cliffs are yellow-brown sandstone. Just north of the hills came back into white + red beds, more dusty, rolling country, no lupines.

Lunch in Bowman, N.D.

Green aphids at base of stalks where the ants were with the larvae.

Sta. 120. 23 mi. n. of Bowman. 1 P. melissa. Very dry, almost nothing flying.

Could find no lupine along US 85 to Belfield on US 10. Got the last room in a motel (5:30 p.m.), had supper in town, and then drove out west 12 miles to badlands. Very impressive but ^{almost} completely covered with vegetation, except on cliffs. Main loop road closed for repairs but 5 mile side road open to Burning Coal Vein, lignite beds burning under the clay, converting it to a brick-like slag or scoria. Very interesting area of cave-ins over the burned-out layers, the drop being fairly even over at least an acre. The remains of the old walk could be seen for 25 yards out from the present edge, having dropped down in fragments at least 4 feet. A trail goes around to the right to the rear of the area. We continued around the circle by climbing over the cracking clay but were forced by hot spots to climb to the top of the north cliff. Saw a mule deer from there. A herd of 15 buffalo blocked the road at one point. Prairie dogs live in abundance near the entrance, showing no fear of the cars.

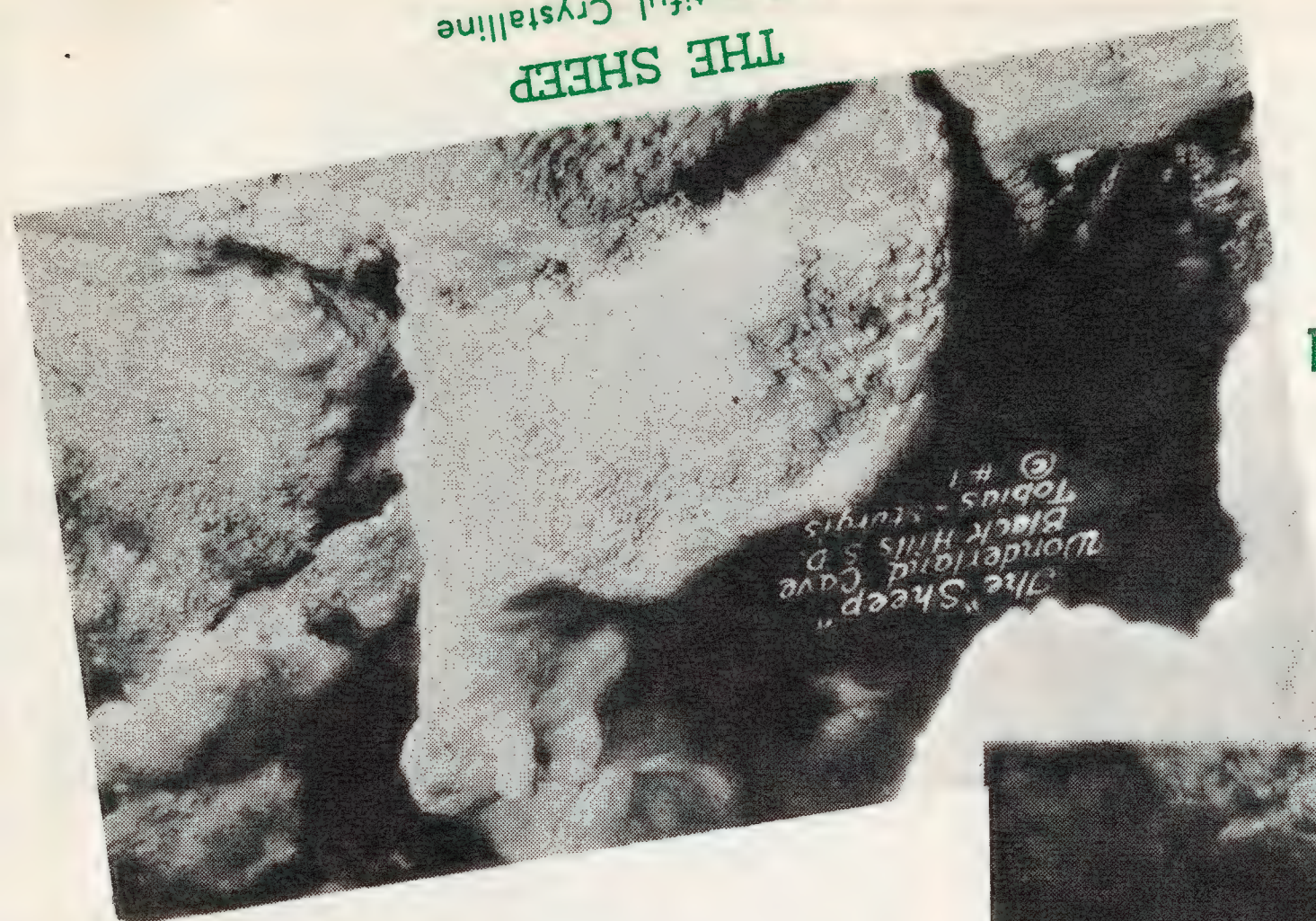
June 30, Mileage 55669. Scattered showers last night.

Sat. In Theo. Roosevelt Nat. Mem. Park we drove 5 mi. n. to the Cottonwood Campground along the Little Missouri River. The ranger told us that the entire area was sprayed with DDT two days ago because the local mosquitoes carry western equine encephalitis. There were plenty of insects flying.

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Weird and Grotesque Formations
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Signs -- See Map on Other Side



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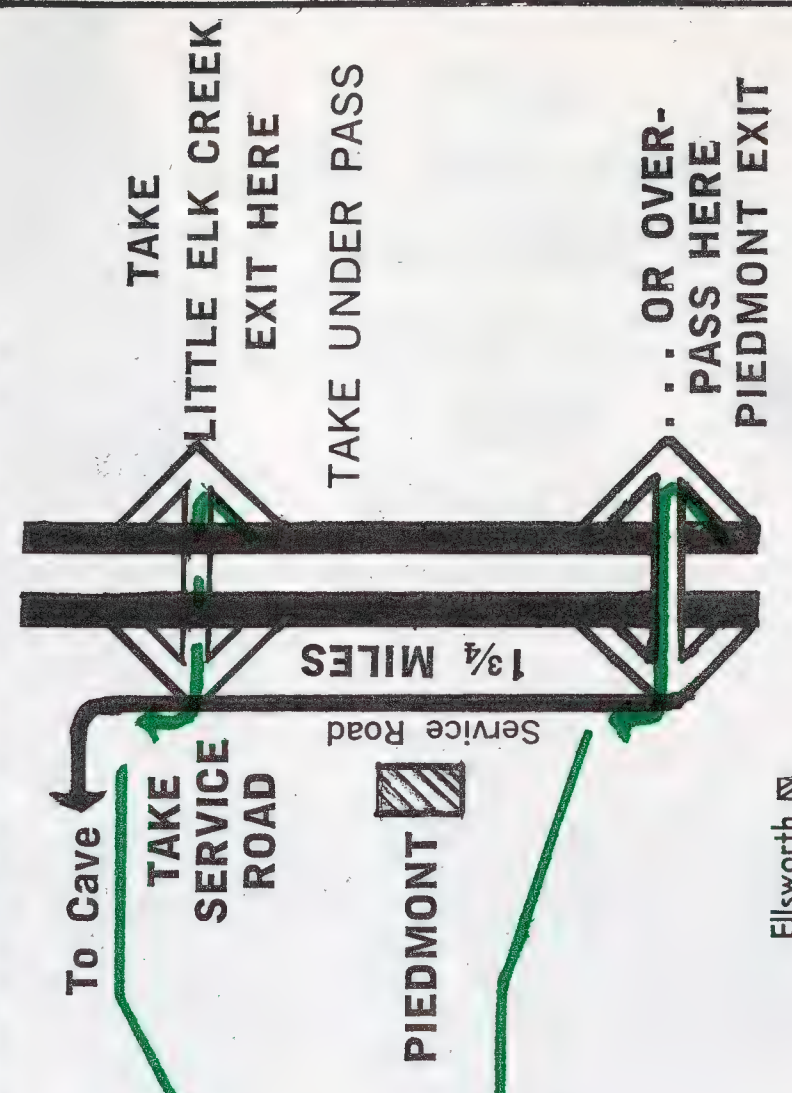
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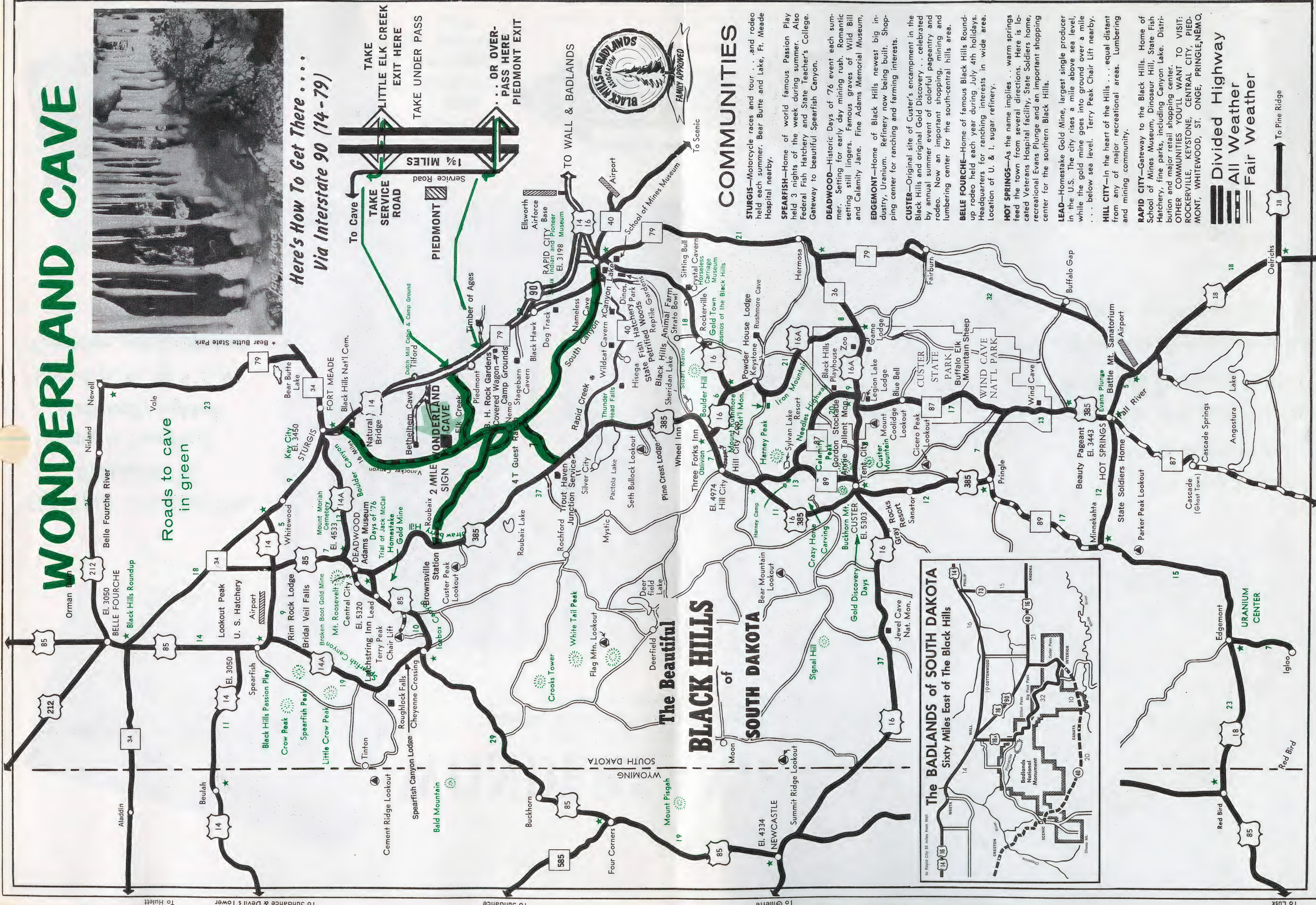
WONDERLAND CAVE



Here's How To Get There . . .
Via Interstate 90 (14-79)



... OR OVER-
PASS HERE
PIEDMONT EXIT



COMMUNITIES

STURGIS—Motorcycle races and tour . . . and rodeo held each summer. Bear Butte and Lake, Ft. Meade Hospital nearby.

SPEARFISH—Home of world famous Passion Play held 3 nights of the week during summer. Also Federal Fish Hatchery and State Teacher's College. Gateway to beautiful Spearfish Canyon.

DEADWOOD—Historic Days of '76 event each summer. Setting for early day mining rush. Romantic setting still lingers. Famous graves of Wild Bill and Calamity Jane. Fine Adams Memorial Museum.

EDGEMONT—Home of Black Hills newest big industry, Uranium. Refinery now being built. Shopping center for ranching and farming interests.

CUSTER—Original site of Custer's encampment in the Black Hills and original Gold Discovery . . . celebrated by annual summer event of colorful pageantry and rodeo. Now an important shopping, mining and lumbering center for the south-central hills area.

BELLE FOURCHE—Home of famous Black Hills Round-up rodeo held each year during July 4th holidays. Headquarters for ranching interests in wide area. Location of U. & I. sugar refinery.

HOT SPRINGS—As the name implies . . . warm springs feed the town from several directions. Here is located Veterans Hospital facility, State Soldiers home, recreational Evans Plunge and an important shopping center for the southern Black Hills.

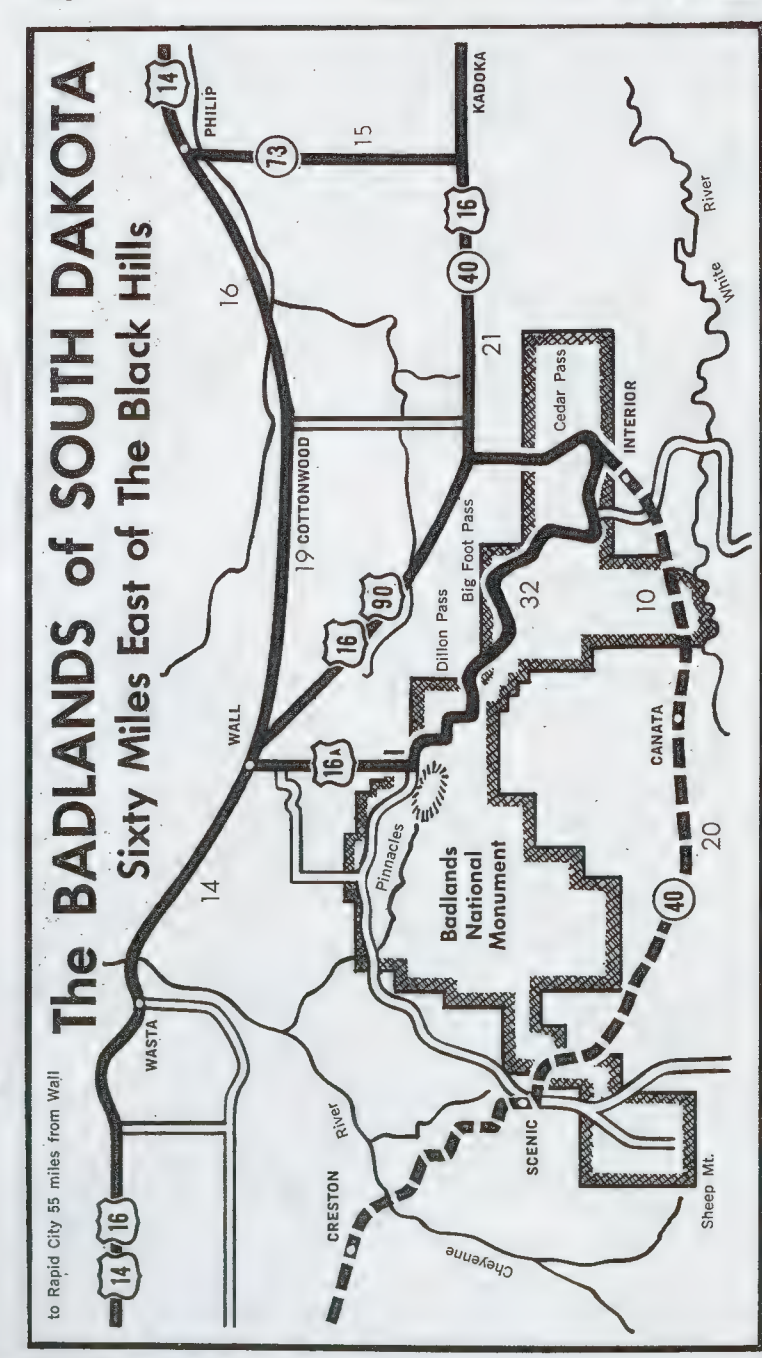
LEAD—Homestake Gold Mine, largest single producer in the U.S. The city rises a mile above sea level, while the gold mine goes into ground over a mile . . . below sea level. Terry Peak Chair Lift nearby.

HILL CITY—In the heart of the Hills . . . equal distant from any of major recreational areas. Lumbering and mining community.

RAPID CITY—Gateway to the Black Hills. Home of School of Mines Museum, Dinosaur Hill, State Fish Hatchery, fine parks, including Canyon Lake. Distribution and major retail shopping center.

OTHER COMMUNITIES YOU'LL WANT TO VISIT: ROCKERVILLE, KEYSTONE, CENTRAL CITY, PIEDMONT, WHITEWOOD, ST. ONGE, PRINGLE, NEMO.

Divided Highway
All Weather
Fair weather



Sta. 121. 5 mi. n. of Medora, N.D. at Cottonwood Campground in Theo. Roosevelt Nat. Mem. Park. 1 *Acanthid*, 1 *Asilid*, 1 field cricket. One small patch of lupine near the river bank. Few leaflets, glabrous, small, non-bushy, heavily in seed. Samples by permission of ranger. The soil is very sandy (fine dark gray sand). Above normal flood level.

Sta. 122. Elev. 3400, on top of Sentinel Butte. Many wild flowers, no lupine, but something very much like it on slopes (very hairy - five leaflets). 2 *Cerambycids*. Down off the peak, a few *Typhas* + *Epicauda*-gray.

Southeast on US 312 (also 212) toward Broadus.

Sta. 123. 3 mi. S.W. of Stacey, Powder River Co., Montana, about 1 mi. into Custer National Forest. Lupine suddenly abundant along road and up among tall grasses. 16 *icarioides*. 2 robber flies, 2 bees, *Epicauda*, coccinellid, flea beetle, red bug. 3800 ft. elev. Edge of pines. 1 larva with very small ants.

Sta. 124. Broadus, Montana. On Mont. rte. 8, US 212, US 213.

1 *Polyphylla* and 1 *cardid* at lights.

July 1. Milcage 55985.

Sun.

While John is at mass, I'll note a few observations about *P. icarioides*. I seldom seem to "flush" it out by disturbing the lupine. Instead, when I stand still a few minutes, one is likely to fly up. When one flies, often a second will fly up

and the two will flit about for a few seconds. Sometimes another species of butterfly or moth will prompt this sudden brief flight. If a specimen is chased very far, it will suddenly disappear, apparently dropped to the ground. In a few cases I've found it, just resting with the wings folded. At such times it can be picked up in the fingers but doesn't take flight readily.

The lupines that we've seen lately have been very local in distribution. Perhaps very abundant but disappearing in a mile or so. There sometimes is no apparent change in the environment.

Most of the accompanying plants - "indicators" are more widely ranging.

The most profuse carpet of wildflowers we've seen anywhere was on the wind-swept top of Sentinel Butte. The variety and number of very low flowers was extreme.

Our theme song has been "Ida, Sweet as Apple Cider," but now we also recognize as our patron saint, St. Ida of the Lupines.

Sta. 125.

Came upon these lupines very suddenly, on a back road west from Mont. rte. 319, to Recluse + US 14/16. There were pines on the hills but none at this point. The lupines ~~disappeared~~ continued to Rte. US 14/16 and then died out. None near Gillette, Moorcroft, Upton, Newcastle.

On U.S. 85 at mileage 56250 John saw a lupine while driving. In the little hills like Teapot dome, about ⁸ mi. n. of Lusk, Wyo. Niobrara Co.

Sta. 126. 8 mi. n. of Lusk, Wyo., on U.S. 85. Roadside at nearby small butte. A dozen eggs (lost have of them), a couple of adults, on sparse lupine. Many plants very small and without flowers. Eggs on basal leaves of large flowering stalks.

Supper at Lusk and on down U.S. 85. Lupines disappeared soon. Saw none in Goshute Co. until almost to Jay Em. Then saw a large field in the distance and tramped over to it. Took one *icia* *risides* on the way. Jumped a creek and found the blue field to be small thistles. Where the blue was flying John found 4 clumps of lupine.

Sta. 127. 2 mi. n. of Jay Em, Wyo. 7 p.m. Elev. 4750'. 1 ♂ *icia* *risides* in dense pasture. Also *Lycaena* sp. (?). 2 *Satanids*, 1 damselfly. 3 eggs

Nodules - west of Biddle, Montana, nr. Wyo. line.

July 2. Mileage . Gering, Neb.
Mon.

July 3 Mileage . Seneca, Kans. on rte. 36.
Tues.

Last night we spent an hour discussing possible improvements in Zool. 102. It might be possible in the Crustacea, for example, after studying crayfish as before, to see and/or dissect isopod, isopod, barnacle, and *Limulus* in one lab, comparing back to crayfish. Make the students notebook of importance to them in these comparisons. The same thing could be done for insects, mollusks, echinoderms, coelenterates, and possibly Protozoa.

1964

June 15. 12688 mi. 12 noon. John Lowrey, Ron Lawrence, Dick B.
 Mon. Univ. car 3-132, '64 Ford. St. Louis - K.C. - Topeka.

485 Stopped at Meadow Acre Motel.

June 16. 13123 mi. We got there! Colorado Springs about 6 p.m. MOT

7. Stopped at Tour Rest Motel - \$10.00 for 3. Supper at Western Pancake
 Shop - good. Tried two strings of bowling. A tie! Phoned
 580 F.M. Brown at Fairview Valley School. Can't see us tonight
 nor until 10:30 tomorrow. He's teaching in summer
 school at Colorado College. We have decided not to
 wait that late. John May see him on return.

June 17. 13703 mi. On our way at 7:30 after pancakes as above.

Wed. Stopped in Manitou for lamp shades - glass - for rearing.

Sta. 201. Mil. 13765. Wilkerson Pass on US 24 west of Colo Spr.

Elev. 9525. Qoneis, asilids, gray Epicauda. Windy & cool.

US 24 to US 285 to US 50 at Poncha Spr. Lunch at Slavans Inn.

Gasoline at Sargents.

1 mi. e. Dorlexville, Colo.

Sta. 202. Mil. 13872. (12 mi. w. Sargents, Colo. or 20 mi. east

237 of Gunnison) First lupines seen - many glabrous ones
 in full bloom. Urisia one rare and in seed, but not
 alongside road. Pressed both lupines. Elev. 8300 ft.

12 maybe
P. ammon

→ 1 Philoxes ♂, 2 ♀, Epicauda on glabrous lupine, asilids,
 bugs. Gunnison Co. In sage brush.

June 18. ± 13940 mi. To Crested Butte & on up to , where

Thurs. is the Rocky Mountain Biological Laboratory. The director
 is Robert K. Enders. They have a couple of dozen log
 buildings and good field lab facilities. 9500 ft.
 We drove back down to the ski area for the night,
 to Crested Butte Lodge. Ron and I climbed about

1000 feet, nearly half a mile, up the ski slope, under the gondola lift. The lodge is run by Kent Bathright and his wife & two small children. A very fancy place and comfortable. We pay \$5 each for room with beds + breakfast, or \$3 with bunkers.

June 18 ± 13940 mi. Drove up to Tab; the snow + rain of last night had dried, except on upper slopes. This area has many large landslides, leaving many valley areas hummocked. All around, the 14,000 peaks are glaciated & all the valleys. From high up, the cirques are very clear.

Sta. 203. 2 mi. east of Highway 135 in Cement Creek Canyon, at Am. Cr. Guard Sta. Sagebrush side gulley had many lupine; only a few in bloom. *Tycaemids*: *Clistrena argialis*, *P. fairmon*, *Agriades glandon*, *Er. comyntas*, many ♂; other lepis || *Tytha* on wild iris & lupine, *Oenias*, *Colias*, skipper-black || Clerid, bibionid flies. Several sawfly spp., Spheroiid wasps, asilid.

Windy & chilly. Sun out only occasionally. Mostly aspen, few pines. *Iris missouriensis*, common, host of green *Tytha*.

Sta. 204. Mil. 13979. 8050 ft elev. on Hy. 135. 3 mi. S. Almont. *Philotes* sp. *Agriades glandon*; *Coccyzus* (yellow), wasps, bee flies, skippers, *Thorevidae*

Sta. 205. 1 mi. east of Hy. 135 at mouth of Cement Creek. (1 mi. W. Sta. 202). *P. icaroides* ♀, *P. saepiolus* ♂. Very wet meadow full of dandelions + another yellow flower. 8500 ft. elev. 4 *Colias philodice* ♂ & ♀. *Phryodes*, *Erebica*. Bright sun.

2 spp. *syrphoides*, another fly.

Had dinner in Crested Butte + then took Don back up to Gothic to spend the night in his cabin and get his things in order before we leave tomorrow.

June 19. The early mornings are beautiful; clear & crisp. Even down at Crested Butte snow-capped peaks are all around, and they are real peaks with clear cirques, much above timberline. At Gothic the narrow valley is surrounded by steep cliffs rising up to 14,000 ft. peaks, largely snow-covered especially after the light snow on Wednesday evening. Wild flowers are profuse in some places, but *jamitbrash* and columbine are not out yet. These valleys are all glaciated, except where there have been landslides, of which there are many. In places it looks as if there had been an unconformity between two types of materials and the upper had slid off. Perhaps the slides are of older glacial materials that were resting on the igneous rocks. Some streams have cut deeply into the glacial valley bottom and then spread out enough to accommodate very elaborate meanderings.

This area began to be developed for skiing in 1960 and now has several fine lodges, 3 lifts, a large jump. It has the facilities of aspen, but less development - smaller area so far. Only one full season so far, but that one was successful. Another lift is now planned. The area never lacks snow.

Within a mile of this lodge last week a woman caught a 30-inch 9-pound trout (on worm!) and the next day a 10-pound one. This was in a little stream running under a road culvert.

Sta. 206. Gothic, Colo. (At Rcky Mt Biol Lab.). 9475 ft on aneroid.

The laboratory can take care of 80 or 90 students, but it prefers to limit to 50 or 60. Only a few are here this early. There are no regular classes. There are adequate electric facilities, privies, prefitted log huts, various kinds of decrepit cabins, and one modern cabin.

June 20 Mil. 14041. Left Crested Butte Lodge at 9:30 am.

~~20~~ Sat. Not gas at Crested Butte. Mil. 14044. about 19 mi. east of Somerset.

Sta. 207. 2.2 mi. west of Crested Butte on Colo. 135 (west of Kebler Pass). Elev. 7700 ft. Mil. 14066. *Typha* spp.: *G. 149 damus* ♀♀, *E. comyntas* ♀, *Erebia*, *Coenonympha*. bees + wasps in profusion, esp. *Homodini*, *asilids*, *hymenoptera*, *Cicada*, flying ants, *bibionid*, *leucodionids*, *Carabus* 2, *Lepturine*, *elater*, 2 dung beetles with dung pill, *Typha* many for *Selandria* - living, *bee* flies, 3 damselflies.

This area, just a few miles west of Kebler Pass was completely different from the alpine country. It is chaparral country, with *Ceanothus*, lupine, daisies, sagebrush. No pines or spruce.

Came out at Delta, Colo., where John mailed the *Typha* with food plants. Post Office closed, but a man took the parcel in after stamps were put on it. Decided to go south through Arroyo to Durango, then west + northwest to by US 160 to Cortez, Colo., Monticello, Utah, + back onto US 50. It was only about 140 mi. to Arroyo, which is little above the Montrose elevation (5820), Arroyo 7721, but surrounded by peaks about 14,000 ft. These are very rugged and connected by high ridges, forming arcs of very rugged country. Not even trails could go across most of these. The Uncompaghe River (n. to Gunnison R.) goes past Arroyo and to Silverton, then the Animas flows south to the San Juan. The pass between, Moles divide, is 10,910 ft.

The mts. due w. of Arroyo is Mt. Sneffels (14,150), south of there, the San Miguel, the La Platas; on the other side no single name except San Juan Mts.

June 21. Sta. 208. Arroyo, Colo. El. 7700', hill just east of town.

Sun. *Stenopogon* in clover or *astragalus* - two eggs may be this. *Erebia comyntas*, *Plebejus saepiolus*. Wood satyrs (*Coenonympha*). Watched many females but couldn't be sure of hosts. 1 *elater*

Sta. 209. Arroyo, Colo. Amphitheatre Campground, east of town. Elev. 8300 ft. *Erebia*, *Aleneis*.

Sta. 210. 2 1/2 mi. s.w. of Arroyo, Colo. on Camp Bird Mine Road. El. 8450. *Papilio damus*, *Polyommatus* seen. Took *Coenonympha*, *Aleneis*, *Erebia* c., *Celastrina argiolus*.

June 22 Mon. Mil. 14214. Left Duray about 8 a.m. over the so-called Million Dollar Highway. It is a good highway, but nothing very difficult to build - or drive.

Sta. 211. Mil. 14267. ^{22 mi. n. of Durango} 11 mi. n. of Hermosa, Colo. El. 8100 ft. *P. icaroides* 1 ♂, *Eures* 1 ♀, *C. argiolus* 1 ♂, *E. lygdamus* 1 ♂.

Also *Aglais*. Large lush lupines. 1 rose chafer.

Sta. 212. Mil. 14281. Hermosa, 9 mi. n. Durango, Colo. Roadside flat with some lupines. *P. icaroides* 3 ♂, *P. melissa* 5 ♂, 1 ♀ alive. 1 damselfly. 6500 ft. elev.

Coming into Duray from the Gunnison valley is abrupt. The very sharp and high ridges are on both the south and east. There is little climb into the narrow valley of Duray, "the Switzerland of America." The two sets of peaks form a half circle around Duray. There are many high waterfalls or cascades, box canyons too tortuous for the sun to reach bottom. A sharp climb up out to the south, by switchbacks and a series of minor dugways. No meadows or parks between Duray and Silverton.

At Silverton we passed the road east to Eureka, which is not even shown on most road maps.

At Durango we turn west on US 160 to Cortez, and Monticello, Utah. Should be semi-desert plateau country.

Durango mileage 14291.

Sta. 213. 20 mi. w. Durango, Colo. on US 160. Elev. 7350 ft.

P. aspiolus 2 ♀, *P. melissa* 1 ♀, *Lycana nivalis* ♀, bombylids, nymphalids, *Caenonympha*, *Phycodes*, *Lione*. Open slope in scrub oak zone. Windy.

Sta. 214. Mesa Verde Nat. Park, Colo. 5 mi. from entrance. (open meadows beyond tunnel). East of Overlook (Montezuma Valley). 7300 ft. (7400 ft. on lupines pressed) Many eggs, all but one on buds, prob. *lygdamus*. *E. lygdamus* ♂♂, *A. glandon*, 1 *E. comyntas*, 2 *P. acmon* 1 ♂ 1 ♀ alive. Rather fly with its labial prey. *Phycodes*, *Melitaea*, *Caenonympha*, many *Acanesodera*, 1 sm. Chrysidid.

We went into the park only about six miles, but had fine views of surrounding high mountains - north and east.

June 23 Tues. Mil. 14417. After breakfast took unnumbered road up into the Abajo Mts. west of Monticello, Utah.

Sta. 215. Dalton Springs C.G., Abajo Mts., San Juan Co., Utah. Elev. 8000. (Mil. 14423). Many *P. aspiolus*, some ovipositing on small white clover. *E. comyntas*. Pressed clover & a lupine (non-host but with a chrysomelid larva - black - same as at Gothic). Velvet ant and bald-faced hornet. Lowrey camped here with Keith Kelton in 1947.

Sta. 216. El. 8750 ft. Abajo Mt. - Blanding road, 1 mi. west of Dalton Springs C.G., (8 mi. w. of Monticello). ~~Colo.~~ Syrphidae, many, Antids, vespid. Monticello mileage 14441.

Avalon Cafe. Asked about wide-mouthed jars, and "Gus" said we could have all we could carry - up to 30 or so!
Sta. 217, 2 mi. n.e. Ta Sal, Utah. El. 6900 ft. 1 nymphalid.

Sta. 218. East foot of Ta Sal Pass, elev. 7550 ft. Ta Sal Mts., San Juan Co., Utah. *P. icaroides* ♀. *Eures comyntas* 1 ♀, ♂♂
Phycodes, *Coenonympha*, Chrysidid. 2 mi. w. Hy. 24.46.

Sta. 219. East foot of Ta Sal Pass, elev. 7800 ft. Ta Sal Mts., Utah. Rocky meadows along stream. Edge of aspen + pine belt, but mostly scrub oak. *E. comyntas* 1 ♀, many ♂♂, *P. saepiolus* ♂♂, 1 ♀, *P. icaroides* 1 ♀, *A. glandon* ♂♂, ♀, *G. lygdamus* 1 ♂, *P. melissa* 1 ♂. *Erebia*, *Phycodes*, *Coenonympha*. flies, hymenops. 3 1/2 mi. w. Hy. 24.46

June 24 Mileage 14664. at Price, Utah.

wed. Sta. 220. 2 mi. w. Soldier Summit, Utah. El. 6300 ft. *P. melissa*, *Melitaes* (nymph).

Down into Utah Valley + up Provo Canyon.

Sta. 221. Aspen Grove (C.G.), east side of Timpanogas M., Utah. El. 5800 ft. *E. comyntas*, *P. icaroides*, *C. argiolus*, *Lycaena rivalis*. *Acmaeodera*, small buprestids, Compyrid. *Phycodes*, *Coenonympha*, 1 megalopteran, flies.

Sta. 222. Mouth of Big Cottonwood Canyon, Salt Lake Co., Utah. Elev. 5100 ft. Lupine in seed, past prime. Many *P. icaroides* ♀♀, *P. melissa* ♂♂. *Homognathus*, *Lepturine*. *Corydalus*. on thistle

June 25. John mailed home three batches of eggs to Mary, -
Thurs. from captured females of *P. icaroides* (Sta. 218) Ta Sal Mts., *P. saepiolus* (Sta. 215) Dalton Spr., Abasco Mts., & *Lygdamus* (Sta. 208) Ouray, Colo. ♀? *G. lygdamus* a few field taken eggs Sta. 214 in Mesa Verde Nat. Park, Colo. Salt Lake City, mil. 14874.

Sta. 223. Peguop Summit, Nev. Elev. 6750 ft. *P. icaroides* ♂ and 10 eggs. Flower beetles. Pressed ex. of lupine from each side of road (south seems to be glabrous + north hirsute) also other flowering plants for Mohlenbrock.

June 26 Mil. 15127 at Elko, Nev.

Fri. Yesterday was the Rawney's wedding anniversary and we stopped in Wells at the hotel at which they stopped on their honeymoon. It was just opened then, but has changed hands since. 15 years ago.

All the desert mountains seemed more rugged than I recalled. The Ruby Mts. had a great deal of snow on both sides.

The Bonneville salt flats had large areas under water, including the speed trial run. The Humboldt River had a lot of water. This was apparently the first warm day of the summer. 90°

Left AS 40 on Nev. 21, Mil. 15171. 10:20 a.m. Sta. 224. 47 mi. s. U.S. 40 on Nev. 21. Foot of Mt. Tenabo. El. 5000 ft. Flowers of Cleome, few hymenops + bugs + 1 dermestid. Beetles on prickly pear flower. Edge of valley.

Sta. 225. Austin, ~~Calif~~ Nev. Elev. 6800 ft. Gulch above town
+ below pass. *P. icarioides* ^{♂♂} ♀♀, *P. melissa* ♀♂, *E. comyntas* ♀♀
E. c. on *Astragalus* (pressed sample). Pressed samples of *Lupine*
also a silvery pubescent hybrid, + other flowers. *Eleodes*,
dragonfly, yellow bumble bee, 2 robber fly in copula.

Sta. 226. Campbell's Canyon, mi. below Carroll Summit,
Elev. 6200 ft. 1 mi. above mouth of canyon. 6 eggs. 1 blue flying.
Lupine pressed + 3 other plants.

June 27 Mileage 15419 at Fallon, Nev. Nevada

Sat. Sta. 227. US 40 west of Reno, in mouth of Truckee River
Canyon, elev. 5000 ft. *Satyrrium behrii* (*Callipsyche*)
many in jar alive, *P. icarioides* 1, *P. acmon*, *P. saepiolus*,
E. comyntas. Skippers, torquins admiral, *Coenonympha*,
Phyciodes, *Melitaea*, clerids, mordellids, green
Epicaonta, small chafers, min. flies + hymenoptera.

Sta. 228. 2 mi. northwest of Alpine, Calif. Cal. Hwy 89.
Elev. 5400 ft. *Mitoura*, *C. argirola* both on *Canothus*?
2 chafers, green meloid, skippers + geometer.

Sta. 229. Quincy, Calif. Elev. 3450 ft. Plumas County.
A few beetles flying at dusk. (In alcohol)

June 28. Mileage 15597. at Quincy, Calif.

Sun. Sta. 230. Butterfly Valley, Calif. 2 mi. S.W. Hy 89
West Quincy + ~~Quincy~~ ^{Keddie}. Elev. 3700 ft. *P. saepiolus*
many incl. live females; *C. argirola* ♂♀, mimic moth
phalaenid. Ailid like bumble bee, cicadas, *Eleodes*,
Lepturini, ichneumonid. Admiral.

Sta. 231. Crescent Mill, Calif. on Hy. 89. Elev. 3500 ft.
Plumas Co. *P. icarioides*, *Speyeria*, *Lyc. xanthoides*?

Striped lepturines, large glabrous humblbees, large red ailid
Eggs on tirante lupine + also on glabrous larger one. Mil. 15617.

Sta. 232. Lake Almanor, Calif. Elev. 4500 ft. Many
lepturines, 1 green cerambycid, bees. 'Colias'.

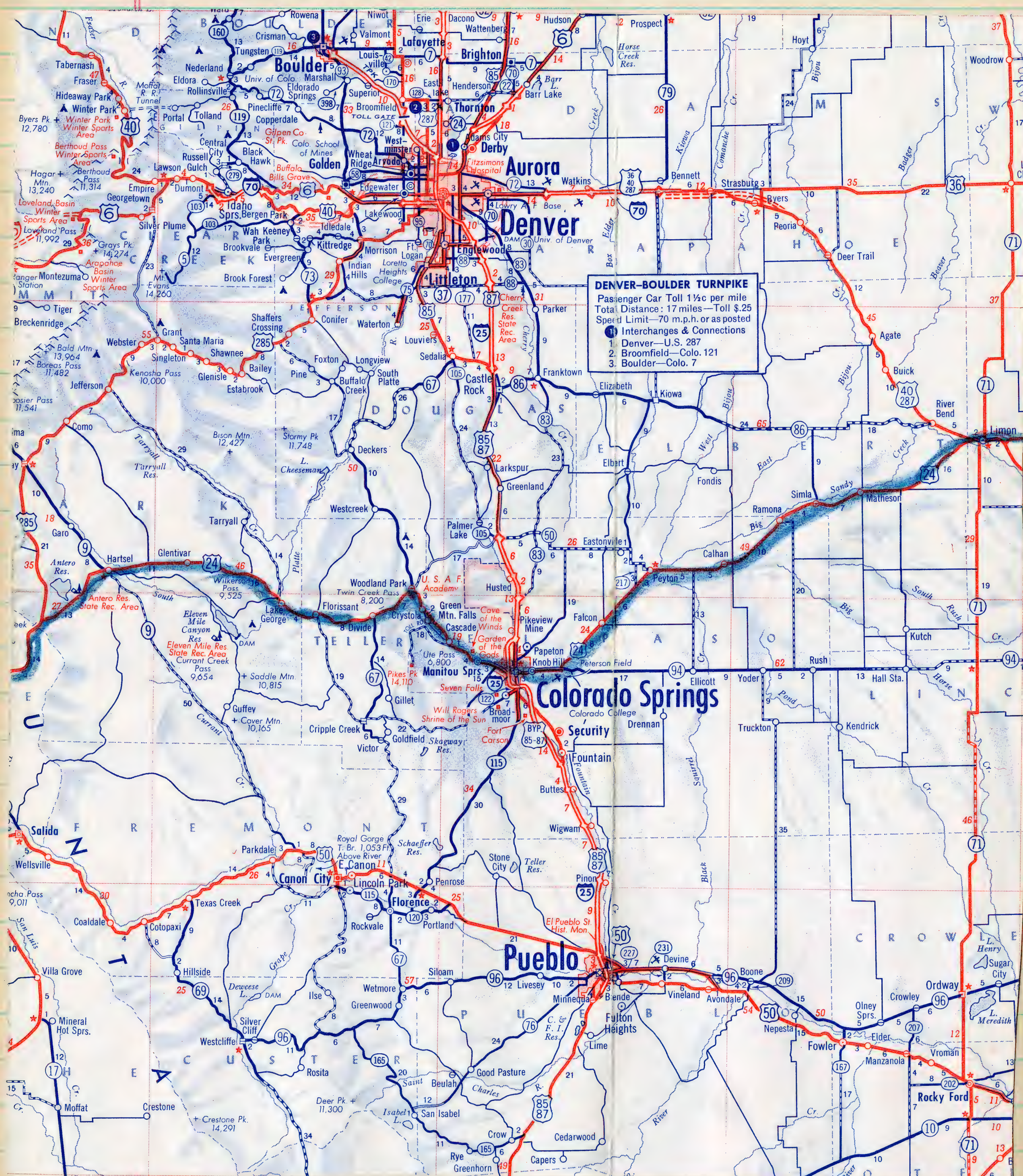
June 29 Mileage 15707. Manzanita Lake Lodge, Lassen Park.

Mon. This will probably be my last day in the "party".
John was quite suddenly sick to stomach last night,
and still feels queasy. Viola

Sta. 233. 7 mi. S. of Manzanita Lake, at Viola, Calif.
Elev. 7300 ft. Calif. Hwy. 44. *Callophrys* ^{3♀ alive} *niva*.

Incaialia angustinus, *P. icarioides*, *P. saepiolus*
12 females many males, *C. argirola*, *Athides halensis*,
Phyciodes, *Brenthia*, "bathy morpho"

Pieris rapae, bee-mimicking Ailid, cercopit nymphs,
Histeridae, Staphylinid, Aphodius, other ailids +
theronid, red cerambycid, small hysocids,
trichopteran.



If You Need Information, Ask a Park Ranger!

Do not throw trash anywhere in Park. USE YOUR TRASH BAG OR TRASH RECEPTACLES.

PETS ARE NOT ALLOWED ON TRAILS OR IN PUBLIC BUILDINGS.

Dogs, cats and other pets must be kept on leashes or in cars at all times.

Fires may be built ONLY in designated campgrounds.

Do not pick wildflowers or damage trees or other vegetation.

Do not feed, tease or molest birds or other animals.

Firearms are not permitted.

Natural features and public property must not be defaced.

Ruins and all archeological objects must be left undisturbed.

Cliff dwellings are entered ONLY with Rangers

HELP US PROTECT AND MAINTAIN THE PARK BY OBSERVING ALL REGULATIONS

Ruins road drives

Self-guiding automobile trips to mesa-top ruins

Free Ranger-guided trips to cliff dwellings

Hiking (Limited written permits required)

THINGS TO DO IN THE PARK—Inquire at Information Desk in MUSEUM concerning:

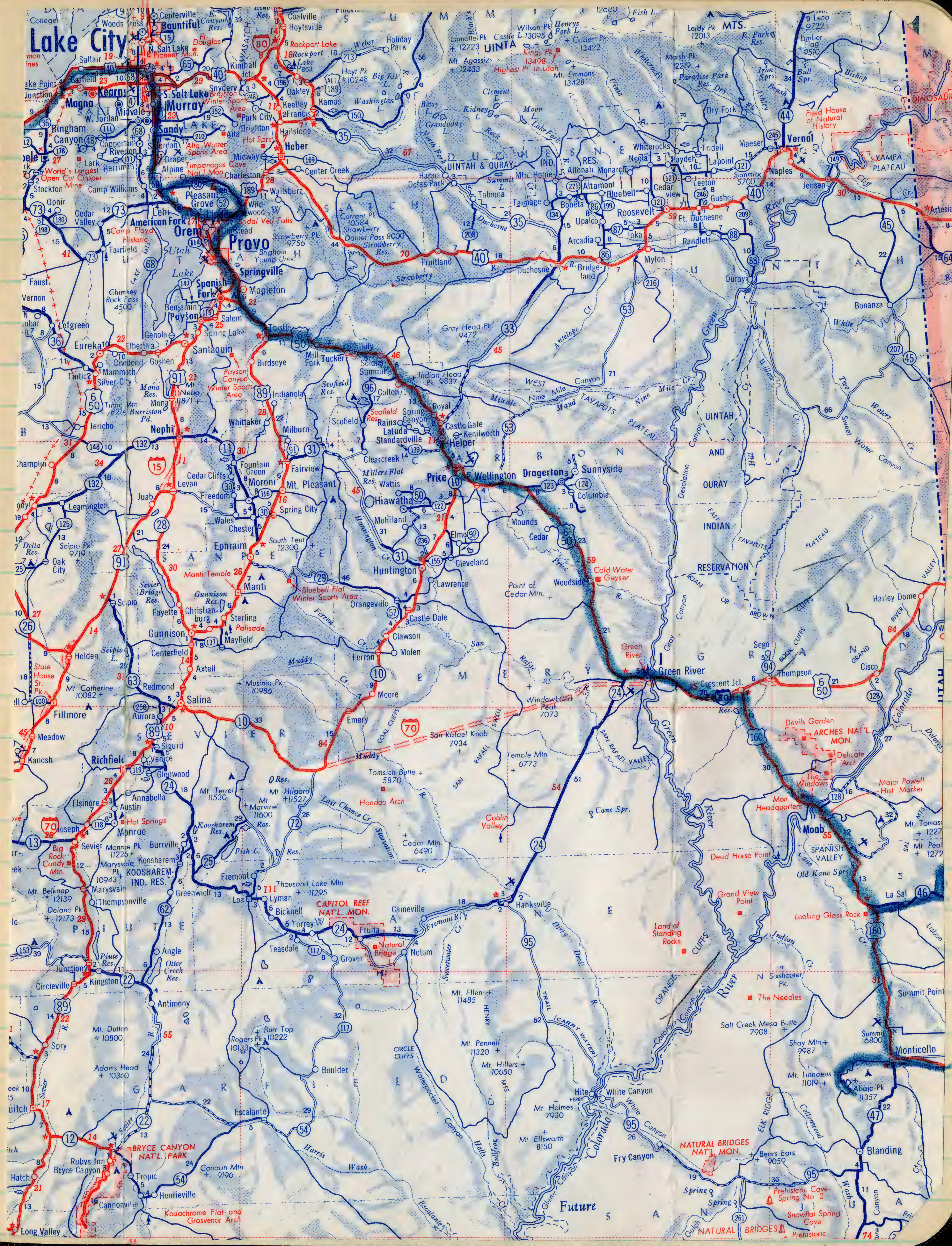
POST OFFICE—At Park Headquarters.

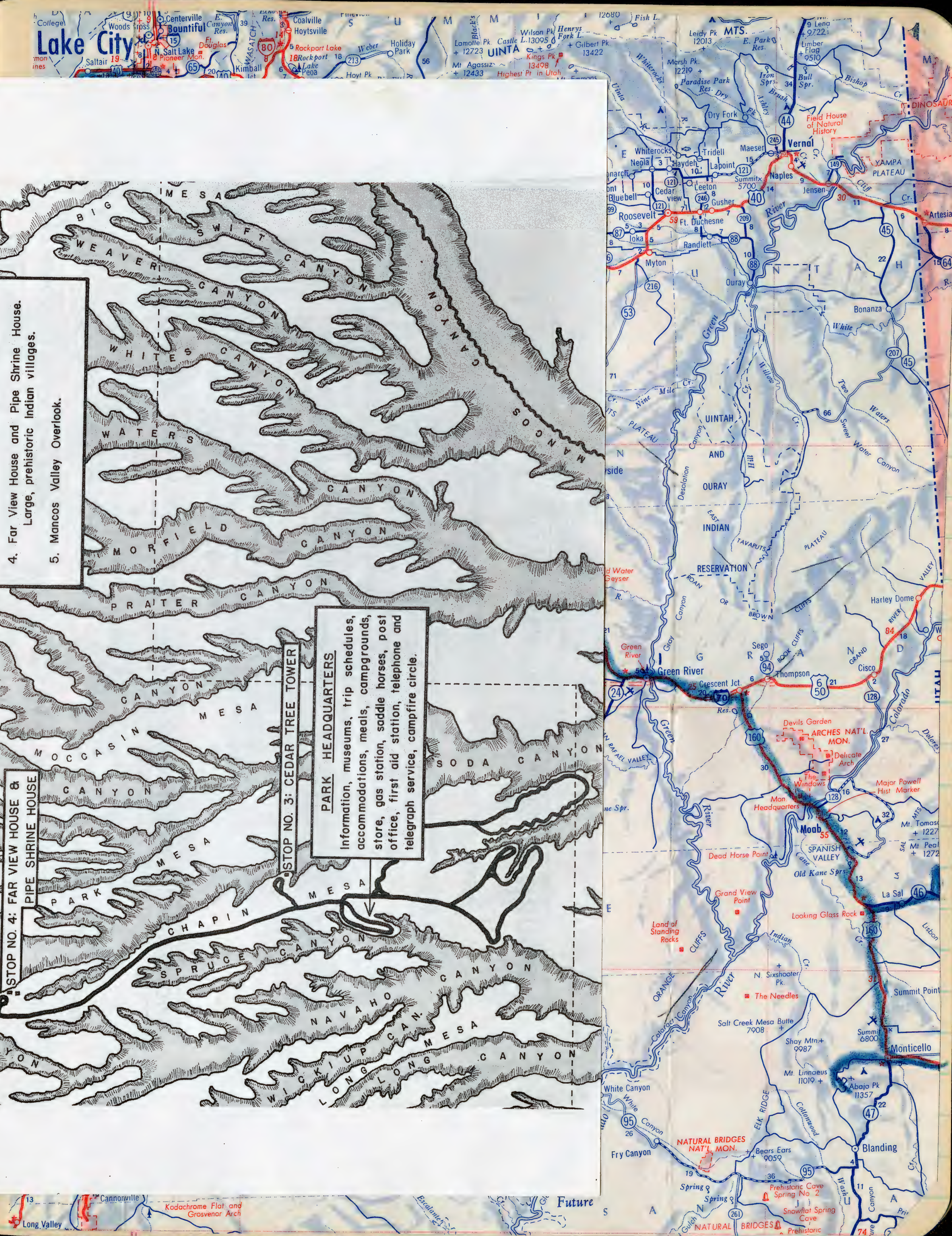
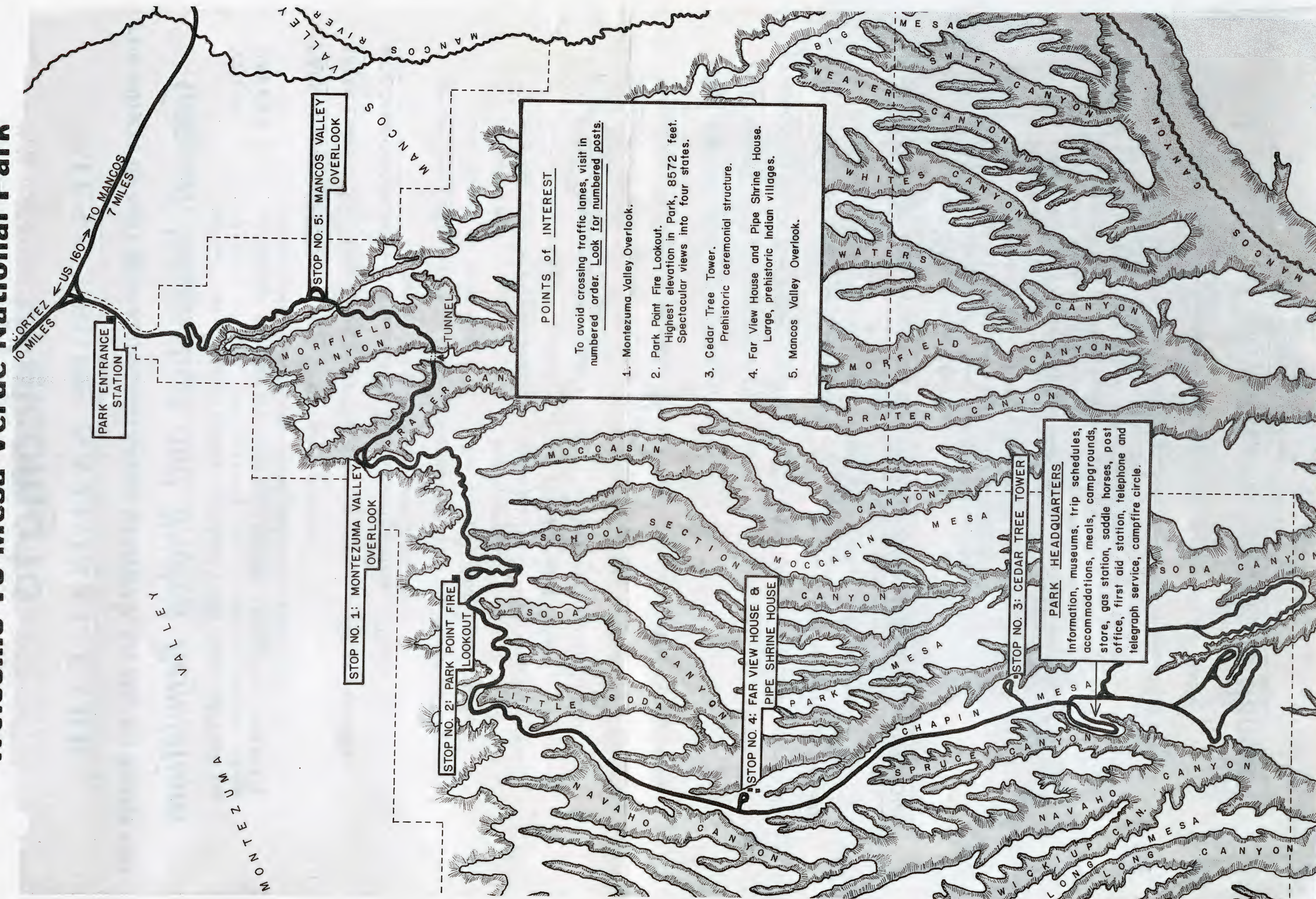
FIRST AID STATION—At Park Headquarters.

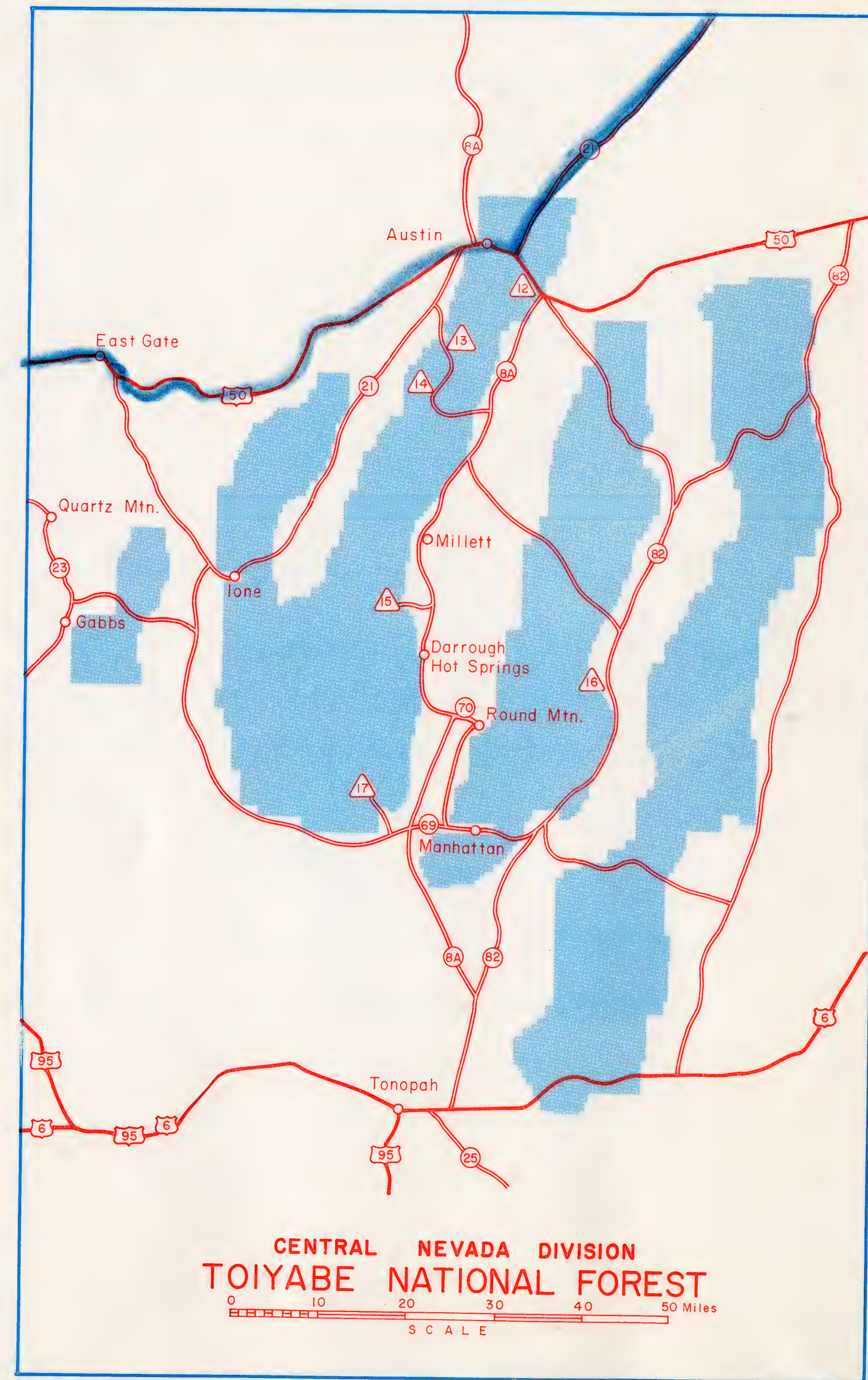
only.

Picnicking—Authorized in picnic areas on ruins road or public campgrounds

Trailers—Use designated sites in public campgrounds.



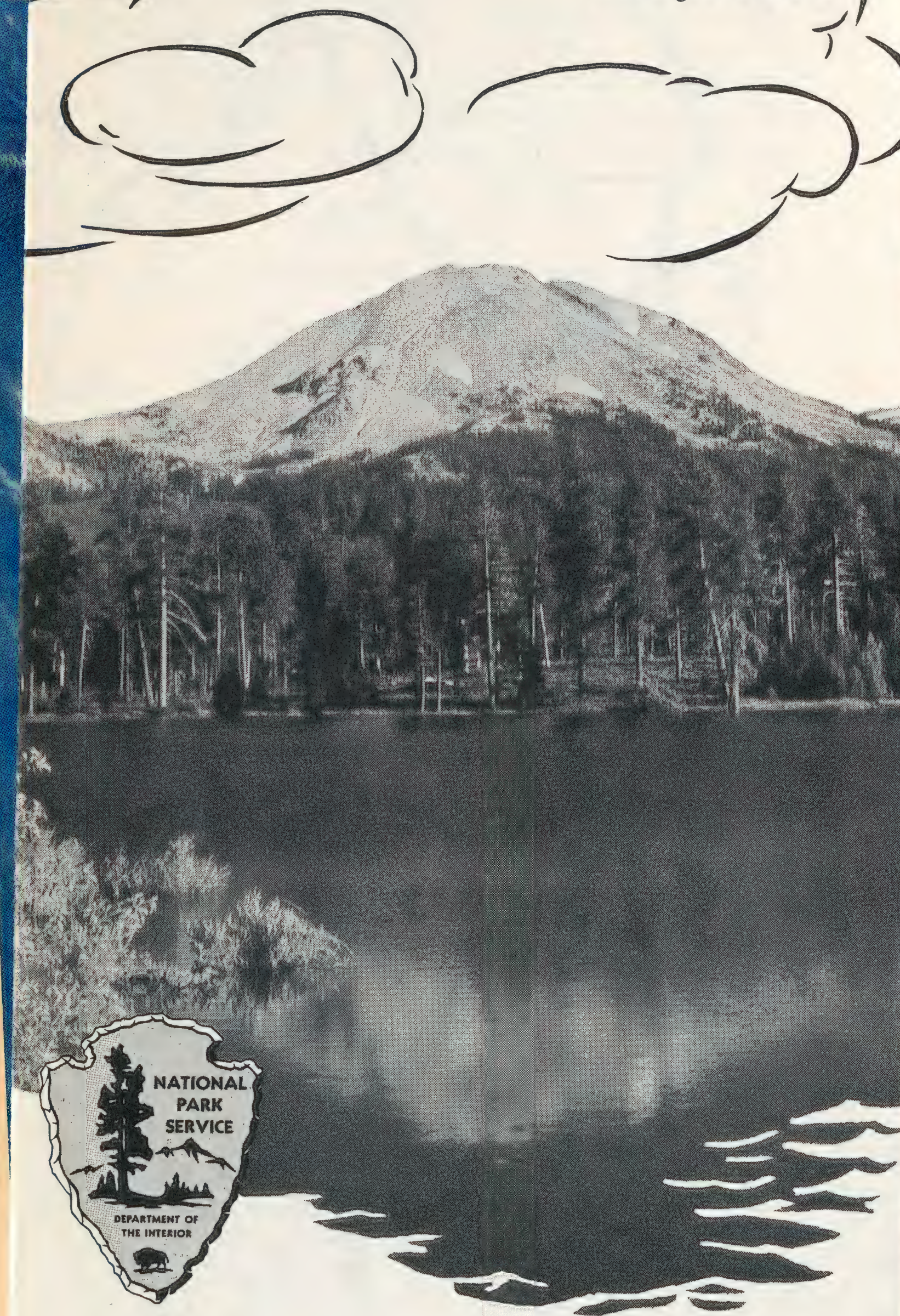




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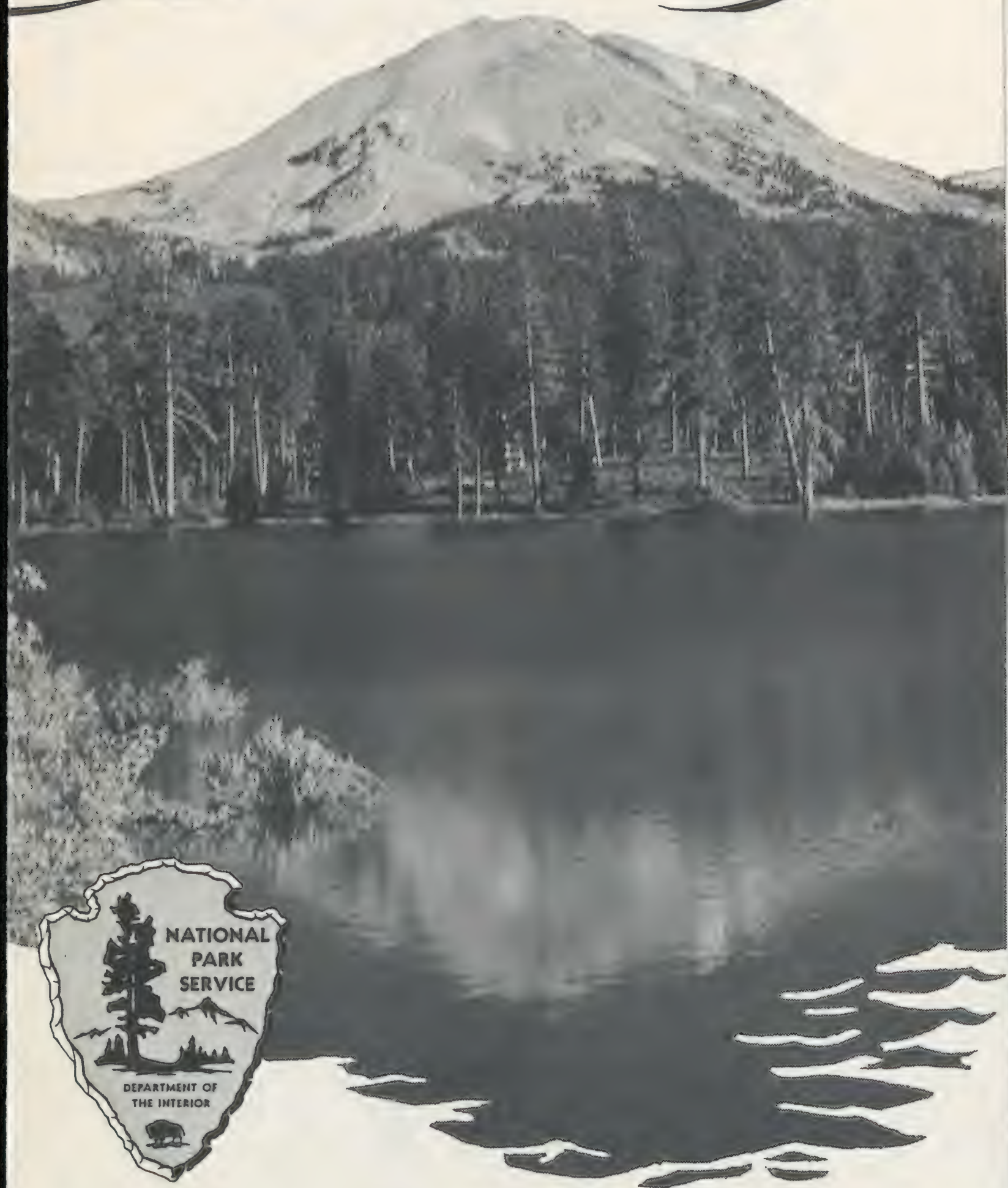
WARNING

In hot springs or steaming areas STAY ON ESTABLISHED TRAILS AT ALL TIMES; keep small children under strict physical control to avoid burns and accidents. Safe-appearing ground crusts may be dangerously thin.

LASSEN VOLCANIC

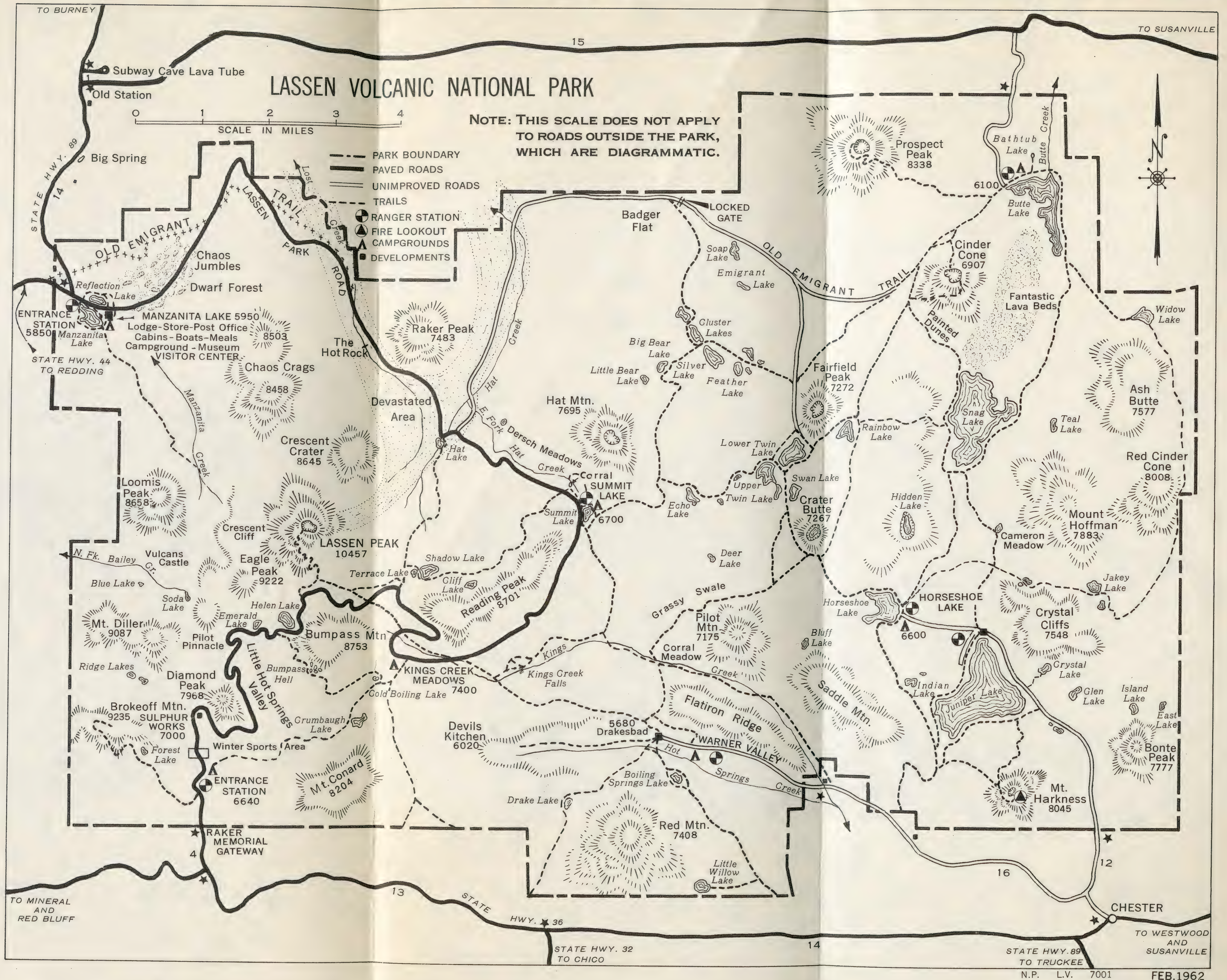
NATIONAL PARK

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given at Manzanita Lake and Summit Lake.

The Manzanita Lake Visitor Center was given to the park by Mr. and Mrs. B. F. Loomis. The building houses a series of dioramas and exhibits that explain the geological story of the park and vicinity. Illuminated transparencies tell of the eruptions of Lassen Peak. Ethnological and historical exhibits portray human aspects of the Lassen story. Publications dealing with park subjects, and topographic maps are on sale at the visitor center; and an attendant is on duty to provide general information.

You are invited to take advantage of the naturalist services, for which there is no charge. Announcements of the programs and schedules are posted on the bulletin boards.

Fishing

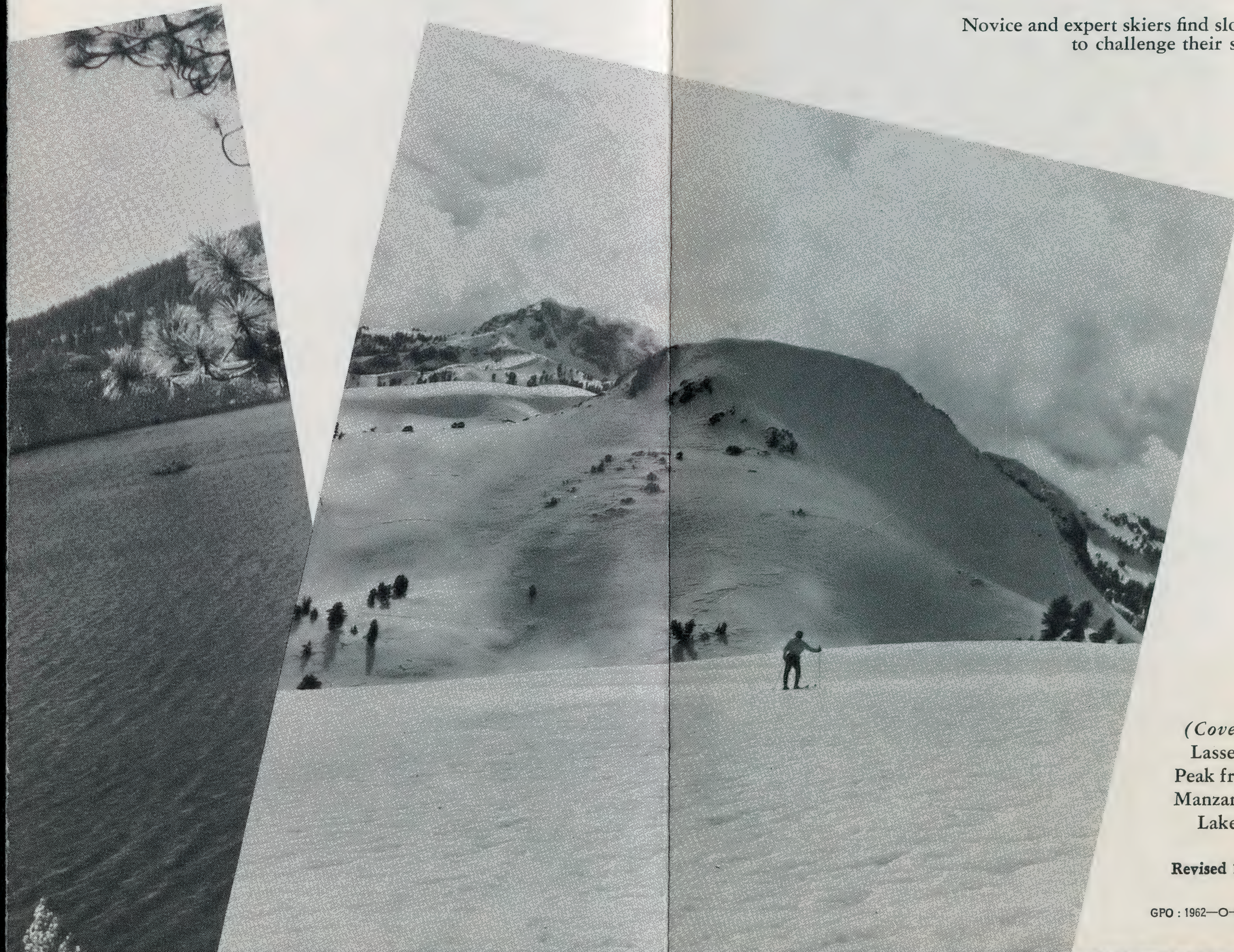
Angling is one of the recreational activities which may be

enjoyed in this park. Rainbow trout, which are native to the waters, are abundant. Brook and brown trout, which are introduced species, are plentiful in some places. The brown bullhead also was brought in; it is found in Manzanita and Reflection Lakes.

Hiking and Horseback Trips

The eastern wilderness and lake sections of the park can be enjoyed only by hikers and horseback parties. Over 100 miles of trail lead to remote sections of the park. Colorful hot springs, gorgeous wildflower meadows, silvery lakes, and other wonders await those who leave the roads and take to the trails. Saddle and pack trips will be arranged for those desiring this service. Hikers can travel the well-marked trails without guides, including the Lassen Peak Trail, where horses are not allowed.

Novice and expert skiers find slopes
to challenge their skill

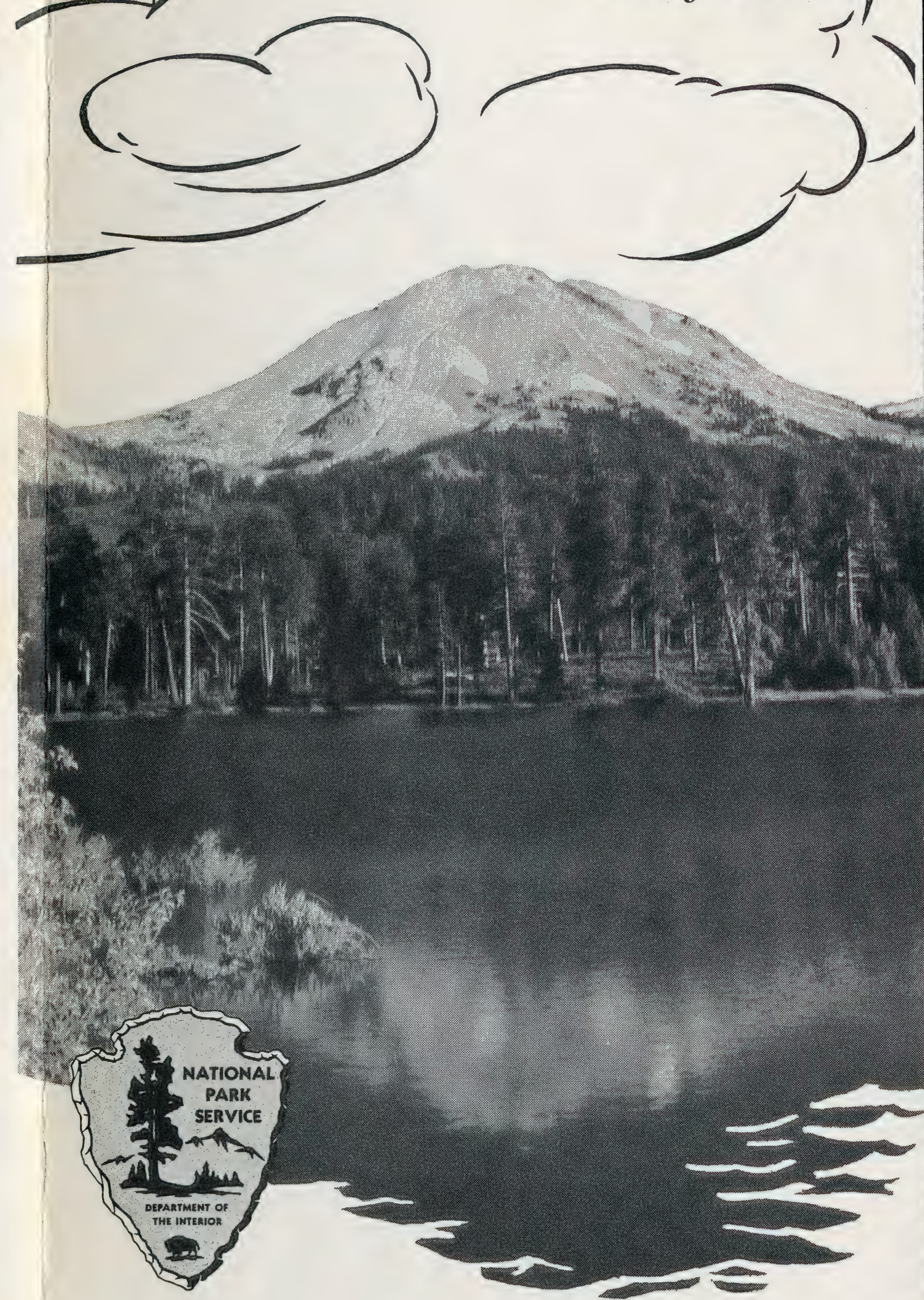


(Cover)
Lassen
Peak from
Manzanita
Lake

Revised 1962

GPO : 1962—O-631547

LASSEN VOLCANIC NATIONAL PARK California



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